COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN II)
Northern And Central California, Nevada, and Utah
Contract No. N62474-94-D-7609
Contract Task Order No. 0030

Prepared for

U.S. DEPARTMENT OF THE NAVY
Gregory A. Lorton, Remedial Project Manager
Southwest Division
Naval Facilities Engineering Command
San Diego, California

DATA GAP INVESTIGATION AT CORRECTIVE ACTION AREAS AND OTHER LOCATIONS AT ALAMEDA POINT SUMMARY REPORT

VOLUME I OF II
(Text, Figures, and Tables)

ALAMEDA POINT
ALAMEDA, CALIFORNIA

TC.0030.10824

March 2, 2001

Prepared by

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5090
Ser 06CA.GL\0226
March 2, 2001

Mr. Brad Job, P.E.
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Job:

SUBJ: DATA GAP INVESTIGATION AT CORRECTIVE ACTION AREAS AND OTHER LOCATIONS AT ALAMEDA POINT

Enclosed is one copy of the above-titled report in two volumes. This report presents the results of the sampling done primarily in support of the petroleum program, but also dealing with several other environmental issues.

If you have any questions or comments, please feel free to call me at (619) 532-0953 or e-mail me at lortonga@efdsw.navfac.navy.mil.

Sincerely,

Gregory A. Lorton

GREGORY A. LORTON, P.E., R.E.A.
Remedial Project Manager
By direction of the Commander

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March 2, 2001

Mr. Gregory A. Lorton
Remedial Project Manager
Southwest Division
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Subject: **Transmittal of the Data Gap Investigation at Corrective Action Areas and Other Locations at Alameda Point Summary Report, Alameda Point, Alameda, California CLEAN II Contract No. N62474-94-D-7609, Contract Task Order No. 0030**

Dear Mr. Lorton:

Enclosed are four copies of Volumes I and II of the Data Gap Investigation at Corrective Action Areas and Other Locations at Alameda Point Summary Report, Alameda Point, Alameda, California. Copies of this document have been sent to other concerned parties in accordance with your transmittal letter and the approved distribution list.

If you have any questions or comments, please call me at (916) 853-4535. Thank you.

Sincerely,

Michelle Reis

Michelle Reis
Project Manager

Enclosures
cc: File

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TETRA TECH EM INC.

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Contract No. N62474-94-D-7609 Document Control No. TC . 0030 . 10824

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DOCUMENT TITLE AND DATE:

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Table

ACRONYMS AND ABBREVIATIONS

AST	Aboveground storage tank
AWQC	Ambient water quality criteria
BERC	Berkeley Environmental Restoration Center
BCT	BRAC Closure Team
bgs	Below ground surface
BRAC	Base Realignment and Closure
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CAA	Corrective action area
CAP	Corrective action plan
CB	Catch basin
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHC	Chlorinated hydrocarbon
CLEAN II	Comprehensive Long-term Environmental Action Navy Contract No. N6247-94-7609
CLP	Contract Laboratory Program
COPC	Chemical of potential concern
DOD	Department of Defense
DQO	Data quality objective
DTSC	California Department of Toxic Substances Control
EBS	Environmental Baseline Survey
E&E	Ecology and Environment
EPA	U.S. Environmental Protection Agency
ERM	Environmental Resource Management-West Inc.
ERV	Ecological reference value
ft	feet
GAIA	GAIA Consulting Inc.
HHRA	Human health risk assessment
IR	Installation Restoration
IT	International Technology Corporation
MCL	Maximum contaminant level
$\mu g/m^3$	Micrograms per cubic meter
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MH	Manhole
MNA	Monitored natural attenuation
Moju	Moju Environmental
MTBE	Methyl tertiary butyl ether
MW	Monitoring well

ACRONYMS AND ABBREVIATIONS (Continued)

NA	Not analyzed
NAS	Naval Air Station
Navy	U. S. Department of the Navy
NOAA	National Oceanic and Atmospheric Administration
OU	Operable Unit
OWS	Oil-water separator
Parsons	Parsons Engineering Science Inc.
PCB	Polychlorinated biphenyl
PRC EMI	PRC Environmental Management Inc.
PRC	Preliminary remediation criteria
PRG	Preliminary remediation goal
PWC	Public Works Center
QA	Quality assurance
QAPP	Quality assurance project plan
QC	Quality control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RWQCB	California Regional Water Quality Control Board
SVOC	Semivolatile organic compound
SWDIV	Southwest Division
TPH	Total petroleum hydrocarbons
TTPH	Total total petroleum hydrocarbons
TtEMI	Tetra Tech EM Inc.
UST	Underground storage tank
VOC	Volatile organic compound

1.0 INTRODUCTION

Tetra Tech EM Inc. (TtEMI) prepared this summary report for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Southwest Division (SWDIV) under Comprehensive Long-term Environmental Action Navy II (CLEAN II) Contract No. N62474-94-D-7609, Contract Task Order No. 0030. This summary report presents the results of a data gap investigation performed between April and June 2000 at Alameda Point (formerly Naval Air Station [NAS] Alameda), Alameda, California. TtEMI conducted the data gap investigation to fill data gaps at 16 corrective action areas (CAAs) identified during preparation of a corrective action plan (CAP), under the corrective action program for petroleum-impacted areas. Data gaps were also investigated at a number of other locations including: nine parcels currently being addressed in the Environmental Baseline Survey (EBS); five sites with underground storage tanks (USTs) that require closure under the Resource Conservation and Recovery Act (RCRA); and Operable Unit-3 (OU-3), which is in the final stages of a remedial investigation (RI) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A total of 12 data gap types were identified across all of these locations. One or more data gap types may be associated with the CAAs, EBS parcels, closing RCRA USTs, and OU-3. Each location was investigated using consistent methods designed to address each data gap type.

Sections 1.1 through 1.4 provide background information for the corrective action program, EBS, RCRA-permitted USTs, and OU-3. Section 1.5 provides descriptions of and the data quality objectives (DQO) associated with each of the 12 types of data gap investigations that were conducted at one or more of the locations identified above. Section 2 presents an overview of the field investigation procedures specific to each of the 12 types of data gap investigations, and Sections 3 through 6 provide the specific information and investigation summaries on each location investigated within CAAs, EBS parcels, RCRA-permitted USTs, and OU-3, respectively. The main purpose of this summary report is to present the data obtained from the data gap investigations. Further analyses of the data as to how it may affect decisions at each location will be addressed in other documents.

1.1 CORRECTIVE ACTION PROGRAM BACKGROUND INFORMATION

Since NAS Alameda was placed on the Base Realignment and Closure (BRAC) list in 1993, a program to decommission all USTs began in August 1994 and continues to the present day. USTs at Alameda Point were used to store aviation fuels, automotive fuels, motor oils, fuel oils, waste oils, and solvents; releases from these USTs have resulted in petroleum-related contamination of soil and groundwater. Several

projects have been implemented for UST removal and site cleanup. TtEMI evaluated petroleum-related contamination at Alameda Point and developed 14 CAAs and two fuel line CAAs (see Figure 1-1). These 14 CAAs and two fuel line CAAs were included in the corrective action program, based on the following categories:

- Sites where USTs and associated fuel lines were removed but petroleum-related contamination remains
- Existing Installation Restoration (IR) sites that have primarily petroleum-related contamination
- EBS parcels not within current IR site boundaries that have primarily petroleum-related contamination
- Fuel lines where either no confirmation samples were collected during removal or where elevated petroleum-related contaminant concentrations remain in soil or groundwater after removal

Information for each CAA is provided in Table 1-1, including site characteristics (International Technology Corporation [IT] 1998), associated UST information (TtEMI 2000c), proposed land reuse (Alameda Redevelopment and Reuse Authority 1996), and proposed groundwater designation (TtEMI 2000f).

The following subsections outline the site closure strategy for petroleum-impacted areas, which is based on Regional Water Quality Control Board San Francisco Bay Region (RWQCB) guidance and development of preliminary remediation criteria (PRC) and corrective action strategies for soil and groundwater.

1.1.1 Site Closure Strategy

The corrective action program for petroleum-impacted areas at Alameda Point is overseen by RWQCB, in cooperation with the California Department of Toxic Substances Control (DTSC) and the Region IX EPA. Because of the nature and source(s) of contamination at Alameda Point, the Navy determined that the most appropriate approach to site closure is to follow guidance issued by RWQCB on the closure of low-risk fuel sites in the San Francisco Bay region (RWQCB 1996). RWQCB guidance concluded that biodegradation of petroleum is an important factor in stabilizing plumes (and may be the only remedial activity necessary in the absence of soil and groundwater petroleum sources) and presents strategies for

closing low-risk soil-only sites and managing low-risk groundwater-impact sites using biodegradation as the preferred remedial alternative. RWQCB guidance describes six factors used to determine whether a site is a low-risk soil site:

1. The leak and source(s) have been removed.
2. The site has been adequately characterized.
3. Little or no groundwater impact currently exists, and no contaminants are found at levels above applicable water quality objectives.
4. No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted.
5. The site presents no significant risk to human health.
6. The site presents no significant risk to the environment.

RWQCB considers a site to be a low-risk groundwater site if the above criteria also apply to groundwater at the site and the dissolved groundwater plume is not migrating.

The site closure strategy developed for petroleum-impacted sites at Alameda Point includes development of PRCs for soil and groundwater that are consistent with proposed land reuse, potential groundwater uses, and potentially completed exposure pathways at each CAA. Soil and groundwater PRCs are screening levels that have been determined to be protective of human health or of ecological receptors. Petroleum constituent concentrations in soil or groundwater that exceed their respective PRC were determined to pose an unacceptable risk, warranting a corrective action. A corrective action will be implemented at each CAA, as required, to ensure that the above-listed RWQCB criteria for low-risk fuel site closure are met and that any remaining petroleum contamination will be biodegraded passively.

PRCs and an overview of the corrective action strategy are discussed in the following subsections. The PRCs presented below were interim levels agreed to with RWQCB and have been changed since the data gap investigation was conducted. However, the interim PRCs are presented below, because they were used to make field decisions during the data gap investigation (see Section 1.5). The updated PRCs and corrective action strategies for soil and groundwater are presented in a letter, Total Petroleum Hydrocarbon Cleanup Strategy at Alameda Point, Alameda, California, issued by the Navy to RWQCB on November 27, 2000 (SWDIV 2000).

1.1.2 Preliminary Remediation Criteria

At the time of the data gap investigation, interim soil and groundwater PRCs were developed for total petroleum hydrocarbon (TPH)-associated compounds (benzene, toluene, ethylbenzene, and xylenes [BTEX]; methyl tertiary butyl ether [MTBE]; and lead) and total total petroleum hydrocarbons (TTPH). TTPH is defined as the sum of all TPH fractions (TPH gasoline-range, TPH-diesel range, TPH-motor oil range; TPH jet fuel-range), and TPH-associated compounds, with the exception of lead. Interim soil and groundwater PRCs are listed in Tables 1-2A and 1-2B, respectively.

California EPA preliminary remediation goals were used as interim soil PRCs for TPH-associated compounds. The Navy selected an interim TTPH PRC for soil of 1,000 milligrams per kilogram (mg/kg). After the data gap investigation was conducted, the soil PRC for TTPH was changed from 1,000 mg/kg to 14,000 mg/kg (saturation concentration) based on negotiations with RWQCB and modeling conducted by Parsons Engineering for Alameda Point (Parsons Engineering Science Inc. [Parsons] 2000). In addition to soil PRCs for TPH-associated compounds and TTPH, residential soil PRCs for TPH fractions (TPH gasoline-range [1,030 mg/kg], TPH diesel-range [1,380 mg/kg], and TPH motor oil-range [1,900 mg/kg]) and non-residential soil PRCs for TPH fractions (TPH gasoline-range [5,900 mg/kg], TPH diesel-range [6,700 mg/kg], and TPH motor oil-range [9,400 mg/kg]) were adopted for Alameda Point based on action levels developed for San Francisco Presidio (Montgomery Watson 1995). Since the PRCs for TPH fractions and the updated PRC for TTPH are greater than 1,000 mg/kg, field decisions that were made using the interim PRC will not affect the overall clean-up strategy for the corrective action program.

To develop interim groundwater TPH-associated compound PRCs protective of aquatic receptors, ambient water quality criteria (AWQC) were multiplied by a factor of 10 to account for dilution and attenuation in the aquifer media before groundwater discharges to surface water. This factor of 10 is in accordance with National Oceanic and Atmospheric Administration (NOAA) guidelines (NOAA 1999). After the data gap investigation was conducted, groundwater TPH-associated compound PRCs protective of aquatic receptors were changed based on negotiations with RWQCB and modeling conducted by Parsons Engineering for Alameda Point (Parsons 2000). However, the interim TPH-associated compound PRCs protective of aquatic receptors were not used to make field decisions; therefore, this change will not affect the overall clean-up strategy for the corrective action program.

Storm drains could also potentially act as direct conduits for groundwater contaminants to impact aquatic receptors. Dilution and attenuation is not considered to occur in this groundwater migration pathway.

Therefore AWQCs were used as groundwater TPH-associated compound PRCs near storm drains. Maximum contaminant levels were used as groundwater PRCs for TPH-associated compounds at sites where groundwater is considered a potential drinking water source.

The Navy selected an interim TTPH PRC for groundwater of 1.4 milligrams per liter (mg/L) based on action levels developed for Treasure Island (TtEMI 1997a). After the data gap investigation was conducted, the groundwater TTPH PRC was changed based on negotiations with RWQCB and modeling conducted by Parsons Engineering for Alameda Point (Parsons 2000). The updated groundwater PRCs for TTPH range from 1.4 to 20 mg/L (depending on the distance form the shoreline). Since the groundwater PRCs for TTPH are greater than 1.4 mg/L, field decisions that were made using the interim PRC will not affect the overall clean-up strategy for the corrective action program. An overview of the clean-up strategy is presented in the following section.

1.1.3 Corrective Action Strategy Overview

The cleanup strategy for the corrective action program for petroleum-impacted areas at Alameda Point was developed to comply with RWQCB's low-risk soil and groundwater criteria (see Section 1.1.1). If TTPH or TPH-associated compound concentrations exceed relevant PRCs at a CAA, then a corrective action will be evaluated and selected for the area. Corrective actions include:

- Soil and groundwater source removal
- Groundwater containment or treatment at CAAs where PRCs are exceeded for a completed exposure (possible drinking water source, through storm drain pathway, or groundwater discharge to surface water)
- Monitored natural attenuation (MNA) at CAAs where groundwater plumes are not migrating and there is no significant risk to human health or the environment

Soil and groundwater containing volatile chlorinated hydrocarbons (CHC) at levels harmful to human health or the environment will not be addressed under the corrective action program for petroleum-impacted areas. However, the corrective action program will address removal of floating product independent of the presence of CHCs in groundwater.

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 1-1 – CORRECTIVE ACTION AREAS

FOR ADDITIONAL INFORMATION, CONTACT:

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SENSITIVE

OAKLAND INNER HARBOR

CAA 2

CAA 14

FUEL LINE CAA A

CAA 6

CAA 1

CAA 8

CAA 5

CAA 10

CAA 7

FUEL LINE CAA B

CAA 3

SEAPLANE LAGOON

CAA 11

CAA 4

CAA 12

CAA 13

SAN FRANCISCO BAY

CAA 9

LEGEND

- CORRECTIVE ACTION AREA (CAA)
- FUEL LINE CAA
- ABOVEGROUND STORAGE TANK
- UNDERGROUND STORAGE TANK
- FUEL LINE

N

550 0 550 1100

SCALE: 1" = 1100'

FIGURE 1-1
CORRECTIVE ACTION AREAS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

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SENSITIVE

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
1	CAA 1 Includes vacant land, paved access roads, and Building 442. Building 442 served as a guard and watchtower.	CAA 1 contained UST 442-1. UST 442-1 had a capacity of 150 gallons and stored diesel fuel for a backup generator located in Building 442.	**Wildlife Refuge** Refuge under USFWS	**Western Region** Unlikely drinking water source
2	CAA 2 lies within IR Site 14 and includes gravel surfaces with little vegetation and no buildings. The Oakland Inner Harbor borders CAA 2 to the north.	CAA 2 contained UST 357-FS1. UST 357-FS1 had a capacity of 1,000 gallons and stored diesel.	**Northwest Territories** Industrial and park areas and possibly a golf course	**Western Region** Unlikely drinking water source
3	CAA 3 lies within IR Site 3 and includes Buildings 109 and 398, Structure 430, and paved and grass-covered areas. Building 109 was a gasoline truck loading station. Building 398 was used for the Auxiliary Power Units and Cooling Air Turbines shop and aircraft engine test cells. Structure 430 was an aircraft truck facility.	CAA 3 contained USTs 398-1 and 398-2 and tanks 97a through 97e. USTs 398-1 and 398-2 each had a capacity of 10,000 gallons and stored JP5. Tanks 97a through 97e each had a capacity of 100,000 gallons and stored aviation gasoline.	**Civic Core/Marina District** Mixed use - mainly commercial, some residential in the Marina District	**Southeastern Region** Potential drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
4	CAA 4 lies within IR Sites 4 and 22 and includes Buildings 163, 372, 414, and former Building 547. Building 163 was used for aircraft maintenance. Building 372 was used as an engine test facility. Building 414 was used for hazardous materials storage. Former Building 547 was used as a gasoline service station and car wash.	CAA 4 contained USTs 163-1, 372-1 and 372-2, and 547-1 through 547-5. UST 163-1 had a capacity of 2,000 gallons and stored fuel oil. USTs 372-1 had a capacity of 6,000 gallons and stored jet fuel and UST 372-2 had a capacity of 1,000 gallons and stored lubricating oil. USTs 547-1 through 547-3 each had a capacity of 12,000 gallons and stored gasoline. USTs 547-4 and 547-5 stored waste oil and had capacities of 5,000 and 10,000 gallons, respectively.	**Inner Harbor** Mixed use - industrial and park	**Southeastern Region** Potential drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 3 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
5	CAA 5 lies within IR Sites 5 and 10 and includes a portion of Building 400, Building 615, and former Buildings 261, 348, and 415. Building 400 was used as a missile armament and avionics rework facility. Building 615 was used for electrical equipment and parts storage. Former Building 261 was used for storage. Former Building 348 was used as a corrosion control shop. Former Building 415 was used for miscellaneous liquids storage.	CAA 5 contained USTs 5-2 and 5-3, 261-1 through 261-3, 400-1, and 615-1 through 615-4. UST 5-2 had a capacity of 4,000 gallons and stored JP5 and UST 5-3 had a capacity of 320 gallons and stored waste oil. USTs 261-1 and 261-2 each had a capacity of 800 gallons and stored kerosene and UST 261-3 had a capacity of 1,500 gallons and stored PD-680. UST 400-1 had a capacity of 250 gallons and stored diesel. USTs 615-1 and 615-2 stored overflow and had capacities of 10,000 and 5,000 gallons, respectively. UST 615-3 had a capacity of 50 gallons and was an OWS, and UST 615-4 had a capacity of 80 gallons and stored waste oil from UST 615-3.	**Civic Core** Mixed use - mainly commercial	**Central Region** Unlikely drinking water source
6	CAA 6 included Building 373 and unpaved areas. Building 373 was used as a fuel loading station.	CAA 6 contained USTs 373-1 and 373-2. USTs 373-1 and 373-2 stored fuel and fuel-contaminated water recovered from an oil-interceptor pit and had capacities of 10,000 and 2,730 gallons, respectively.	**Civic Core** Mixed use - mainly commercial	**Central Region** Unlikely drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 4 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
7	CAA 7 lies within IR Site 7 and includes Buildings 459 and 506. IR Site 7 was a former paved fuel station, with unpaved vacant lot to the north. Building 459 was used as an automobile service station. Building 506 was used for maintenance and miscellaneous equipment storage.	CAA 7 contained USTs 459-1 through 459-8 and UST 506-1. USTs 459-1 through 459-5 had capacities of 10,000 gallons and stored gasoline, UST 459-6 had a capacity of 8,000 gallons and stored gasoline, UST 459-7 had a capacity of 2,000 gallons and stored waste oil, UST 459-8 had a capacity of 600 gallons and stored fuel oil. UST 506-1 had a capacity of 1,400 gallons and stored lubricating oil.	**Main Street Neighborhood** Residential and park	**Central Region** Unlikely drinking water source
8	CAA 8 lies within IR Site 8 and includes Buildings 114 and 191. Building 114 was used for public works maintenance and storage shop activities, office equipment storage, and an administrative office. Building 191 was used for storage.	No associated USTs Three OWSs were present near Building 114 and received drainage from the storage yard of the building.	**Civic Core** Mixed use - mainly commercial	**Central Region** Unlikely drinking water source
9	CAA 9 includes Buildings 584 and 608 and paved areas with vegetation growing through. Building 584 was used for corrosives, lubricating oils, and water treatment chemical storage. Building 608 was an automobile service and repair facility.	CAA 9 contained USTs 584-1, 584-2, and 608-1. USTs 584-1 and 584-2 each had a capacity of 4,000 gallons and stored diesel for a boiler in Building 584. UST 608-1 had a capacity of 600 gallons and stored waste oil from operations conducted in Building 608.	**Inner Harbor/Marina District** Mixed use - industrial and park, some residential in the Marina District	**Southeastern Region** Potential drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 5 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
10	CAA 10 includes Building 491, a portion of Building 19, and paved, open parking space. Building 19 was used as a control tower, photographic processing department, and fire/rescue station. Building 491 was used to house an emergency generator.	CAA 10 contained UST 491-1. UST 491-1 had a capacity of 1,000 gallons and stored gasoline for backup generator located in Building 491.	**Civic Core** Mixed use - mainly commercial	**Central Region** Unlikely drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
11	CAA 11 lies within IR Site 11 and includes Building 14, Areas 37, and Structure 598. Building 14 was an aircraft engine test and repair facility. Area 37 was a former fuel storage area. Structure 598 is a secondary containment area with 3 aboveground tanks used to store aircraft fuel. Seaplane Lagoon borders CAA 11 to the west.	CAA 11 contained USTs 14-1 through 14-6 and 37-1 through 37-24. USTs 14-1 through 14-3 each had a capacity of 10,000 gallons and stored lubrication oil, UST 14-4 had a capacity of 1,000 gallons and stored waste oil, UST 14-5 had a capacity of 4,500 gallons and stored gasoline, and UST 14-6 had a capacity of 600 gallons and stored diesel. USTs 37-1 through 37-24 stored diesel, gasoline, jet fuel, and other miscellaneous liquids. USTs 37-1 through 37-8 and USTs 37-13 through 37-16 each had a capacity of 25,000 gallons, USTs 37-9 through 37-12 each had a capacity of 27,000 gallons, USTs 37-17 through 37-19 each had a capacity of 13,000 gallons, UST 37-20 had a capacity of 1,500 gallons, USTs 37-21 through 37-24 each had a capacity of 28,000 gallons	**Marina District/Inner Harbor** Mixed use - commercial, industrial, park, and some residential in the Marina District	**Southeastern Region** Potential drinking water source except for Parcels 155A and 155C which are unlikely drinking water sources

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 7 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
12	CAA 12 includes Buildings 29 and 38; Facilities 461A, 461B, and 461C; and three open-space areas. Building 29 was an aircraft weapons overhaul and testing facility. Building 38 served as an acoustical enclosure for aircraft engines. Facilities 461A, B, and C served as aircraft run-up areas.	No associated USTs	**Wildlife Refuge/Marina District** Refuge under USFWS Mixed use - mainly commercial with some residential	**Central Region** Unlikely drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 8 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
13	CAA 13 lies within IR Sites 13 and 23 and includes Buildings 397, 460A, 529, 600, and 606; the former Pacific Coast Oil Works refinery; and paved open spaces. Building 397 was a jet engine testing facility. Building 460A was used to contain control equipment for a defueling facility. Building 529 was used to supply auxiliary power for Building 530. Building 600 was used as a support building for Building 530. Building 606 was used as an administration building. The Pacific Coast Oil Works Refinery operated from 1879 to 1903.	No associated USTs	**Inner Harbor** Mixed use - industrial and park	**Southeastern Region** Potential drinking water source
14	CAA 14 includes Building 331 and unpaved areas, with little vegetation. Building 331 was used as a woodworking facility and offices.	No associated USTs	**Northwest Territories** Industrial and park	**Western Region** Unlikely drinking water source
Fuel Line A	Fuel Line CAA A contained two parallel, 10-inch fuel lines used to transport JP-5.	No associated USTs	**Northwest Territories/Civic Core** Mixed use – commercial, industrial, and park	**Western and Central Region** Unlikely drinking water source

TABLE 1-1

CORRECTIVE ACTION AREAS AND RELEVANT INFORMATION
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 9 of 9)

CAA	Site Characteristics	Associated USTs	Proposed Land Reuse	Proposed Groundwater Designation
Fuel Line B	Fuel Line CAA B contains three east-west, parallel fuel lines, with multiple crossing fuel lines (about 22,500 feet) that tie together a series of fueling pits. The fuel lines were abandoned in place in 1998 and were formerly used to transport jet fuel.	No associated USTs	**Marina District/Civic Core** Mixed use - mainly commercial and some residential in the Marina District	**Central Region** Unlikely drinking water source

Notes:

CAA	Corrective action area
FS	Feasibility study
IR	Installation restoration
JP5	
OWS	Oil water separator
USFWS	U.S. Fish and Wildlife
UST	Underground storage tank

TABLE 1-2A

PRELIMINARY REMEDIATION CRITERIA FOR SOIL
ALAMEDA POINT, ALAMEDA CALIFORNIA
(Page 1 of 1)

Constituent	CAAs 3 through 13 Residential PRCs (mg/kg)	CAAs 1, 2, and 14 Nonresidential PRCs (mg/kg)
Benzene	0.65[a]	1.5[b]
Toluene	520[a]	520[b]
Ethylbenzene	230[a]	230[b]
Total Xylenes	210[a]	210[b]
Total total petroleum hydrocarbons	1,000[c]	1,000[c]
Lead	400[a]	750[b]

Notes:

[a] California EPA Residential 1999 PRGs
[b] California EPA Industrial 1999 PRGs
[c] Department of the Navy-selected criteria

CAA Corrective action area
EPA U.S. Environmental Protection Agency
mg/kg Milligrams per kilogram
PRC Preliminary remediation criteria
PRG Preliminary remediation goal

TABLE 1-2B

PRELIMINARY REMEDIATION CRITERIA FOR GROUNDWATER
ALAMEDA POINT, ALAMEDA CALIFORNIA
(Page 1 of 1)

Constituent	CAAs 1, 2, 5, 6, 7, 8, 10, 12, and 14 AWQC x 10 (mg/L)	Storm Drains at CAAs 2, 3, 4, 7, 9, and 11 AWQC (mg/L)	Drinking Water Area CAAs 3, 4, 9, 11, and 13 MCL (mg/L)
Total total petroleum hydrocarbons	14	1.4	14
Benzene	7	0.7[a]	0.001[d]
Toluene	50	5[a]	0.15[d]
Ethylbenzene	0.43	0.043[a]	0.43
Total Xylenes	0.13	0.013[b]	0.13
Lead	0.081	0.0081[a]	0.015[d]
Methyl tertiary butyl ether	4.4	0.44[c]	0.013[d]

Notes:

[a] National Oceanic and Atmospheric Administration. 1999. "Screening Quick Reference Tables". Guidelines used by the Coastal Resource Coordinator Branch of National Oceanic and Atmospheric Administration. March.

[b] Suter, G.W., and C.L. Tsao. 1996. "Toxicological Benchmarks for Wildlife: 1996 Revision." Oak Ridge National Laboratory. Oak Ridge, Tennessee. ES/ER/TM-86/R3.

[c] Boeri, R.L., J.P. Magazu, and T.J. Ward, 1994. "Acute Toxicity of Methyl Tertiary Butyl Ether to the Musid, Mysidopsis bahia." Study No. 424-AR. T.R. Wilbury Laboratories, Inc. Massachusetts. 21 Pages.

[d] Maximum contaminant level for drinking water

AWQC Ambient water quality criteria
CAA Corrective action area
MCL Maximum contaminant level
mg/L Milligrams per liter
PRC Preliminary remediation criteria
TPH Total petroleum hydrocarbon

1.2 ENVIRONMENTAL BASELINE SURVEY BACKGROUND INFORMATION

Alameda Point is divided into 207 EBS parcels (see Figure 1-2). The EBS was performed to identify the environmental condition of all property affected by the closure of NAS Alameda in September 1993. Preparation of the EBS was mandated under the Base Closure and Realignment Act of 1988 and the Defense Base Closure and Realignment Act of 1990 (BCP 1997).

The EBS process allows the BRAC Cleanup Team (BCT) to assess the condition of all base property and to make accelerated decisions on a parcel's suitability for lease or transfer. During the EBS process, each parcel is inventoried according to the environmental condition of the property and known or suspected hazards associated with the current and previous uses of each parcel are identified. Site-specific information gathered during the initial phase of the EBS investigation is used to categorize each parcel into one of the following Department of Defense (DOD) categories:

- **Category 1:** Areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
- **Category 2:** Areas where only release or disposal of petroleum products has occurred
- **Category 3:** Areas where release of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action
- **Category 4:** Areas where release of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken
- **Category 5:** Areas where release of hazardous substances has occurred, and removal and/or remedial actions are underway, but all required remedial actions have not yet been taken
- **Category 6:** Areas where release of hazardous substances has occurred, but required response actions have not yet been implemented
- **Category 7:** Areas that have not been evaluated or require additional evaluation

The secondary goals of the EBS are to facilitate conveyances of parcels designated in Categories 1 through 4 and to conduct additional investigations to identify the appropriate compliance program for DOD Category 7 parcels (BCP 1997).

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 1-2 – EBS PARCELS

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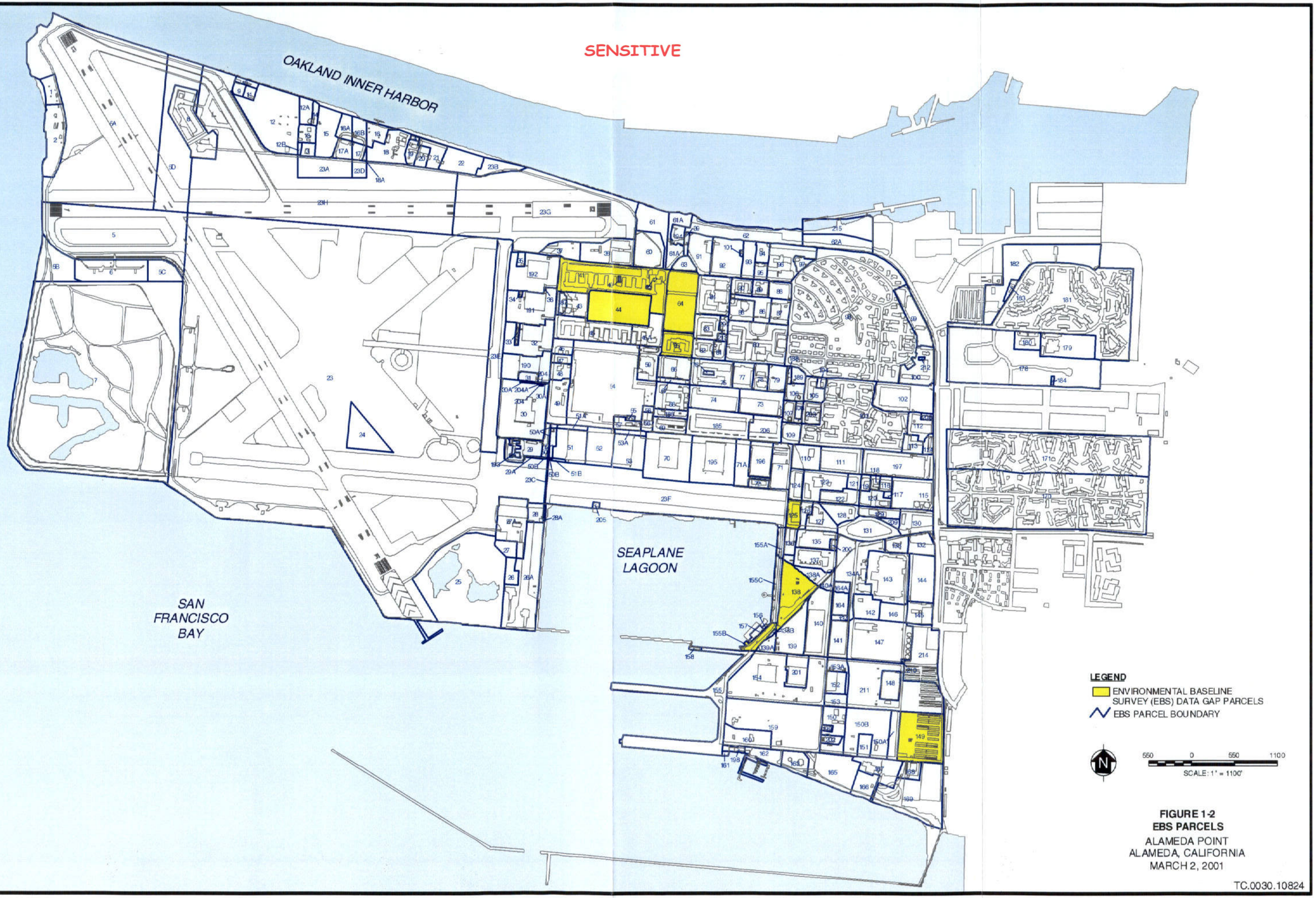

FIGURE 1-2
EBS PARCELS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECTS\DGS CTO30_DGI\CAA_JAN01_C.APR FIG1_2_11_17

1.3 RESOURCE CONSERVATION AND RECOVERY ACT CLOSURE PLAN BACKGROUND INFORMATION

Data gaps were identified at five RCRA-regulated USTs that are current candidates for closure under RCRA. These USTs include USTs 37-1, 37-3, 37-4, 37-13 through 37-16, 615-3, and 615-4 (see Figure 1-3).

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 1-3 – RCRA-PERMITTED USTs

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SENSITIVE

OAKLAND INNER HARBOR

SEAPLANE LAGOON

SAN FRANCISCO BAY

261
261-3
615
615-3
615-4
615-1
615-2

37-18
37-17
37-22
37-21
37-23
37-7
37-8
37-11
37-12
37-13
37-14
37-15
37-16
37-1
37-2
37-3
37-4
37-5
37-6
37-9
37-10
180
170
168

LEGEND

- RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)-PERMITTED UNDERGROUND STORAGE TANK (UST)
- ABOVEGROUND STORAGE TANK
- UST
- FUEL LINE

N

550 0 550 1100
SCALE: 1" = 1100'

FIGURE 1-3
RCRA-PERMITTED USTs
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECTS\DGS CTO30_DGNCAA_JAND1_C.APR FIG1_3_11_17

SENSITIVE

1.4 OPERABLE UNIT-3 BACKGROUND INFORMATION

The Navy received a remedial action order in 1998 from the California Department of Health Services, now overseen by the California Environmental Protection Agency DTSC. The remedial action order identified IR sites within NAS Alameda to be targeted for remedial action. NAS Alameda was designated for closure in 1993. As part of the BRAC strategy for stationwide investigation and cleanup, the IR sites have been grouped into six operable units OUs, OU-1 to OU-6, based on environmental issues, in order to facilitate accelerated site investigation and cleanup.

OU-3, which consists of IR Site 1, is located in the northwestern corner of Alameda Point (see Figure 1-4) and was operated between 1943 and 1956 as NAS Alameda's main site for waste disposal. The landfill is approximately 14.7 acres in size and includes a former pistol range. The landfill reportedly received all waste generated at NAS Alameda, except liquid waste, which was discharged directly to the Seaplane Lagoon (Ecology and Environment [E&E] 1983). Limited information is available regarding construction of the OU-3 landfill. An RI was conducted for OU-3, and the final RI report was published in August 1999.

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 1-4 – OPERABLE UNIT-3

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OAKLAND INNER HARBOR

OU 3

OU 4B

OU 1

OU 1

OU 4B

OU 6

OU 5

OU 4A

OU 6

OU 1

OU 2C

OU 1

OU 1

OU 2B

SEAPLANE LAGOON

OU 4B

SAN FRANCISCO BAY

OU 6

OU 2A

OU 4B

OU 1

LEGEND

OPERABLE UNIT-3

OPERABLE UNIT (OU) BOUNDARY

N

550 0 550 1100

SCALE: 1" = 1100'

FIGURE 1-4
OPERABLE UNIT-3
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECTS\DGS CTO30_DGI\CAA_JAN01_C.APR FIG1_2_11_17

1.5 DATA GAPS

As discussed in Section 1.0, this summary report presents the results of the data gap investigation conducted to fill (1) data gaps identified at 16 CAAs, (2) data gaps identified at nine EBS parcels, (3) RCRA closure requirements for USTs 37-13 through 37-16 and 615-4, and (4) a data gap identified at OU-3. Data gaps were grouped into 12 data gap types, which are presented below. Table 1-3 provides an overview of the types of investigations that were conducted at each CAA, EBS parcel, RCRA-permitted UST, and OU-3.

I. **Data Gap Type I - Floating Product.** Floating product, defined as a source in groundwater, was encountered in excavations during UST removals and suspected in groundwater with TTPH levels exceeding 20 mg/L. Elevated levels of TTPH are present at many CAAs; therefore, an investigation was conducted to determine if floating product is present at those locations. Temporary piezometers were installed, and floating product was assessed. Where floating product was not present, a groundwater sample was collected and analyzed for TPH, TPH-associated compounds, and MNA parameters to assess current site conditions and the feasibility of conducting MNA at the site.

II. **Data Gap type II - Storm Drain Exposure Pathway.** Storm drains located within CAAs may act as potential migration pathways for contaminated groundwater to reach aquatic receptors in surface water. If groundwater samples collected near storm drains had concentrations of TTPH or TPH-associated compounds that exceeded PRCs, and if the storm drain pipeline was below the groundwater table, then the storm drain was sealed off and dewatered. If groundwater infiltration occurred from within the specified storm drain reach, the rate of infiltration was calculated and a grab water sample was collected and analyzed for TPH and TPH-associated compounds.

III. **Data Gap Type III - Current Groundwater TTPH Concentrations Near Storm Drains.** Insufficient data was available to evaluate whether groundwater TTPH or TPH-associated compound concentrations exceed PRCs near storm drains located within some CAAs. Groundwater samples were collected adjacent to storm drains from existing monitoring wells or using direct-push techniques. Samples were analyzed for TPH and TPH-associated compounds. If TTPH or TPH-associated compound levels exceeded PRCs, a Data Gap Type II investigation was also implemented at these areas.

IV. **Data Gap Type IV - Oil-water Separators (OWSs).** OWSs located at three CAAs were not characterized in previous investigations. Each OWS was first visually inspected for signs of TPH contamination. If TPH contamination was suspected, then soil and groundwater samples were collected using direct-push techniques. Samples were analyzed for TPH and TPH-associated compounds. If floating product was found, then a Data Gap Type I investigation was also implemented at these areas.

V. **Data Gap Type V - Soil Source Areas.** Isolated TPH soil source areas may be present near structures at four CAAs and one EBS parcel. Excavation of these source areas beneath the structures (a corrective action alternative evaluated under the CAP) may not be practical; therefore, petroleum levels and extent of contamination were assessed. Soil

samples were collected and analyzed for TPH and TPH-associated compounds. If TTPH or TPH-associated compound levels exceeded PRCs, then in situ remedial alternatives will be evaluated in the CAP.

VI. **Data Gap Type VI - CHCs in Groundwater.** CHCs may be present in groundwater at two CAAs and three EBS parcels. These locations were identified based on investigations conducted under the IR, EBS, and UST programs. Groundwater samples were collected from existing monitoring wells or using direct-push techniques. Samples were analyzed for volatile organic compounds (VOC). If CHCs are present, then groundwater will be evaluated under Comprehensive Environmental Response, Compensation, and Liability Act.

VII. **Data Gap Type VII - MTBE Migration in Groundwater.** MTBE is a fuel oxygenate that has been added to gasoline in recent years. Two known service stations were in operation at Alameda Point at CAAs 4 and 7. Samples historically were not analyzed for MTBE; therefore, groundwater samples were collected from existing monitoring wells and analyzed for MTBE. If MTBE levels exceeded PRCs in the farthest upgradient or downgradient wells, then direct-push groundwater step-out samples were collected to identify potential monitoring well locations for selecting and implementing corrective action alternatives to be evaluated in the CAP.

VIII. **Data Gap Type VIII - Current Polychlorinated biphenyl (PCB) Soil Concentrations.** PCBs were detected above EPA Region IX preliminary remediation goals (PRGs) in one shallow soil sample collected at EBS Parcel 138. To determine current conditions and the extent of PCB contamination, a shallow soil sample was collected adjacent to the previous sampling location and analyzed for PCBs. If elevated PCB levels were found, then radial step-out samples were collected.

IX. **Data Gap Type IX - Soil and Groundwater Contamination from Fuel Lines.** Between June 1998 and February 1999, about 58,600 linear feet of fuel line were removed or closed in place. During removal, confirmation samples were not collected along portions of the removed fuel lines. In addition, many of the fuel lines were located near storm drains. Storm drains may act as potential migration pathways for contaminated groundwater to reach aquatic receptors in surface water. Therefore, soil and groundwater samples were collected using direct-push techniques at evenly spaced intervals and at intersections of storm drain lines. Samples were analyzed for TPH and TPH-associated compounds. If TTPH or TPH-associated compound concentrations exceeded PRCs, then a Data Gap Type II investigation was implemented.

X. **Data Gap Type X - RCRA Closure Plan Sampling.** To satisfy the RCRA closure requirements for USTs 37-13 through 37-16, additional soil and groundwater samples were collected and analyzed for VOCs and metals. VOC and metal concentrations were evaluated against DTSC criteria for closure of USTs 37-13 through 37-16. To satisfy the RCRA closure requirements for UST 615-4, additional soil samples were collected and analyzed for semivolatile organic compound (SVOC) and TPH. SVOC and TPH concentrations were evaluated against DTSC criteria for closure of UST 615-4. If DTSC will not close USTs 37-13 through 37-16 and 615-4 based on the data collected under this data gap investigation, then a corrective measures study will be negotiated with DTSC. No further action will be conducted under this data gap investigation.

XI. **Data Gap Type XI - Confirmation of Metals Concentrations in Groundwater.** During the Phase II EBS investigation conducted at Parcel 27A, elevated concentrations of aluminum, arsenic, lead, mercury, and vanadium were detected in groundwater. Parcel 27A cannot be transferred until the elevated metals concentrations in groundwater are addressed. However, groundwater samples collected during the Phase II EBS were not filtered prior to analysis, resulting in metals concentrations being biased high. Therefore, filtered groundwater samples were collected from Parcel 27A and analyzed for metals. Filtered groundwater samples represent bioavailable metals concentrations. If metals concentrations in the filtered groundwater samples do not exceed tiered screening criteria for selection of chemicals of potential concern (COPCs), then no further action will be conducted and Parcel 27A will be submitted for transfer. If metals concentrations exceed tiered screening criteria for selection of COPCs, then a risk assessment or remedial action will be considered for groundwater at Parcel 27A (including the possibility of a land use control or groundwater use restriction) as part of the finding of suitability to transfer process.

XII. **Data Gap Type XII - 1,4-Dioxane in Groundwater.** Diffusive flux of VOCs through the existing soil in the landfill areas was determined at OU-3 using the EPA recommended flux chamber. 1,4-Dioxane was reported at seven surface flux sampling locations at concentrations between 3.2 and 6.9 micrograms per cubic meter ($\mu g/m^3$). A human health risk assessment (HHRA) at OU-3 indicated that these concentrations did not pose an unacceptable risk for the inhalation pathway. However, 1,4-dioxane was not included as a target analyte for groundwater in previous investigations at OU-3. Therefore, sampling at existing monitoring wells screened in the first water-bearing zone (FWBZ) was conducted to determine if this compound is present in groundwater. Samples were analyzed for VOCs. If 1,4-dioxane is present at concentrations that exceed the proposed ecological reference value (ERV), an ecological risk assessment (ERA) will be performed. Remedial action for groundwater in the areas potentially identified in the risk assessment as general response areas, if necessary, will be evaluated in a feasibility study for OU-3.

The results of the data gap investigation are intended to provide additional information needed to (1) assist in completing an evaluation of remedial alternatives for each CAA, (2) classify EBS parcels for transfer, (3) close USTs 37-13 through 37-16 and 615-4, and (4) complete the OU-3 RI. A brief description of data gap sampling rationale is outlined in the following section.

1.5.1 Data Quality Objectives

DQOs were developed using a seven-step process outlined in the Guidance for the DATA Quality Objective Process (EPA 1994). DQOs clarify the study objective, define the most appropriate type and conditions of data collection, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity of data needed to support decision-making. DQOs are used to develop a scientific and resource-effective design for data collection. Project-specific descriptions for the seven steps are presented in Tables 1-4A through 1-4L for each of the 12 data gap types identified in Section 1.5 of this summary report.

TABLE 1-3

DATA GAP INVESTIGATION SUMMARY
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

Location Type	Location Name	Data Gap Types
Corrective Action Areas	CAA 1	I
	CAA 2	I, III
	CAA 3	I, II, III, V, VI
	CAA 4	I, V, VI, VII
	CAA 5	I
	CAA 6	I, II
	CAA 7	I, II, VII
	CAA 9	I, III, IV
	CAA 10	I, V
	CAA 11	I, II, IV, IX
	CAA 12	III
	CAA 13	I, II, III, IV, V
	Fuel Line CAA A	III, IX
	Fuel Line CAA B	IX
Environmental Baseline Survey Parcels	EBS Parcel 27A	XI
	EBS Parcels 41, 44, 64, and 65	VI
	EBS Parcel 125	V
	EBS Parcel 138	VIII
	EBS Parcel 149	VI
	EBS Parcel 155B	VI
Closing RCRA USTs	USTs 37-13 through 37-16	X
	UST 615-4	X
OU-3	OU-3	XII

Notes:

CAA	Corrective action area
OU-3	Operable Unit-3
RCRA	Resource Conservation and Recovery Act
UST	Underground storage tank

TABLE 1-4A

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE I
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 2)

DATA GAP TYPE I: FLOATING PRODUCT
Step 1: State the Problem
• Elevated TTPH concentrations (above 20 mg/L) were detected in groundwater at 10 corrective action areas; in addition, floating product was observed in the excavations during several of the UST removals. The presence and extent of floating product (defined as > 0.1 inch nonaqueous-phase liquid) at these locations is currently unknown.
Step 2: Identify the Decisions
• Is floating product present at the locations with TTPH concentrations above 20 mg/L or where floating product was observed during UST removal at quantities requiring delineation and corrective action?
Step 3: Identify Inputs to the Decision
• Background information on historical operations at the study area • Data from previous investigations (including installation restoration, environmental baseline survey, and UST programs) collected within the study area between 1991 and 1999 • Geologic and hydrogeologic data • Potential remedial technologies for floating product such as bioslurping • Results of the study outlined in this work plan, including thickness and rate of recharge of any floating product identified during the initial investigation
Step 4: Define the Site Boundary
• One floating product observation point will be investigated initially at the location of the highest historical TTPH concentration above 20 mg/L. • The study boundary for Data Gap Type I is one step-out from the last downgradient observation point that indicates no floating product; however, the step-outs will not go beyond the area defined by historical non-detect TTPH concentrations. A step-out is defined as 20 feet downgradient of the previous observation point. • A groundwater sample will be collected from the last temporary piezometer with no observed floating product.
Step 5: Develop the Decision Rule
• If the initial observation point does not have more than 0.1 inch of floating product after 24 hours of recharge time after piezometer installation, then the location is not considered to have floating product and no removal action will be conducted. • A step-out observation point will be installed if the last observation point has greater than 0.5 inch of floating product and fulfills one or both of the following criteria: 1. Floating product greater than 0.1 inch recharges the observation point within 24 hours after the initial floating product sample is collected. 2. The nearest downgradient historical non-detect TTPH concentration is located more than 20 feet from the initial observation point. The capture zone of treatment technologies, such as bioslurping, is estimated to be a radius of 20 feet.
Step 6: Specify Limits on Decision Errors
• The sampling effort for Data Gap Type I focuses on evaluating an area of known contamination to assess the appropriateness of a treatment technology, and a statistical analysis of existing data is not considered to be necessary. The step-out distance of 20 feet is based on the distance to the nearest historical sampling locations and the capture zone of potential treatment technology alternatives.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data. • Field screening data and floating product indicators will be used to assess the presence of floating product and whether step-out samples are necessary. • The Data Gap Type I investigation will provide the information to determine whether a floating product removal is required and to select the appropriate floating product corrective action alternative, if needed.

TABLE 1-4A

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE I
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 2)

DATA GAP TYPE I: FLOATING PRODUCT (Continued)
Step 7: Optimize the Design (Continued)
• The groundwater sample collected from the last temporary piezometer installed will be analyzed for total petroleum hydrocarbons and associated compounds and MNA parameters to provide a baseline to evaluate the feasibility of conducting MNA as a corrective action for groundwater. MNA parameters include alkalinity, chloride, conductivity, dissolved oxygen, iron (II), methane, nitrate, sulfate, oxidation-reduction potential, pH, and temperature.

Notes:

mg/L Milligrams per liter
MNA Monitoring natural attenuation
TTPH Total total petroleum hydrocarbons
UST Underground storage tank

TABLE 1-4B

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE II
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE II: STORM DRAIN EXPOSURE PATHWAY
Step 1: State the Problem
• Storm drains adjacent to or intersecting groundwater concentrations of TTPH or BTEX exceeding PRCs were identified at 11 corrective action areas by the CAP. It is unknown whether TTPH-impacted groundwater is infiltrating the storm drains that may provide a preferential flow path for TTPH-impacted groundwater to reach surface water.
Step 2: Identify the Decisions
• Is TTPH impacted groundwater infiltrating storm drains and discharging directly to surface water at concentrations that could pose unacceptable risk to ecological receptors?
Step 3: Identify Inputs to the Decision
• Data from previous investigations, including installation restoration, environmental baseline survey, and underground storage tank investigations, collected between 1991 and 1999 • Invert elevations of storm drain • Range of historical groundwater elevations at monitoring wells located near the storm drains • Analytical results of infiltrated groundwater, if present, collected from the storm drains • Ecological water quality criteria
Step 4: Define the Site Boundary
• Storm drain reach between the upgradient and downgradient manholes intersecting, or potentially intersecting, identified TTPH plume or elevated groundwater concentrations exceeding PRCs
Step 5: Develop the Decision Rule
• If the storm drain reach intersecting or potentially intersecting the impacted groundwater is never submerged below the groundwater table, then no further investigation will be conducted. Otherwise, that reach of the storm drain will be isolated, and a grab water sample will be collected from the downgradient manhole. • If TTPH, BTEX, methyl tertiary butyl ether, or lead concentrations from the sample exceed PRCs (ecological reference values) (Table 1-2B), then containment or pipeline repair alternatives will be evaluated in a future version of the CAP.
Step 6: Specify Limits on Decision Errors
• Data Gap Type II sampling locations are based on potentially impacted storm drains, and final selection of sampling locations will be made after concurrence by Regional Water Quality Control Board; San Francisco Bay Region; therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against ecological water quality criteria accurately. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data. • If the storm drain is determined to act as a preferential flow path, additional investigation may be necessary to optimize the corrective action alternative selected for the storm drain pathway.

Notes:

BTEX	Benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective action plan
PRC	Preliminary remediation criteria
TTPH	Total total petroleum hydrocarbons

TABLE 1-4C

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE III
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE III: CURRENT GROUNDWATER TTPH CONCENTRATIONS NEAR STORM DRAINS
Step 1: State the Problem
• Groundwater data collected at seven CAAs did not adequately define the extent of TTPH contamination to evaluate the storm drain exposure pathway because of the following reasons: (1) an incomplete suite of analytes were analyzed in previous samples, (2) no groundwater samples were collected, or (3) no samples were collected near the storm drains.
Step 2: Identify the Decisions
• Do current TTPH concentrations in groundwater near storm drains at CAAs with insufficient groundwater data indicate that the storm drain pathway requires further evaluation?
Step 3: Identify Inputs to the Decision
• Data from previous investigations, including installation restoration, environmental baseline survey, and underground storage tank investigations, collected between 1991 and 1999 • Analytical results of groundwater samples collected near storm drains from existing monitoring wells and additional direct-push samples during this investigation • Ecological water quality criteria
Step 4: Define the Site Boundary
• A groundwater sample will be collected at each proposed direct-push location and existing monitoring well located near storm drains. • No additional step-out samples will be collected, regardless of whether groundwater concentrations exceed ecological water quality criteria.
Step 5: Develop the Decision Rule
• If groundwater TTPH concentrations indicate that floating product may be present (TTPH >20 mg/L), then a Data Gap Type I investigation will be conducted. • If the groundwater sample collected near the storm drain exceeds ecological water quality criteria (Table 1-2B), then the nearby storm drain will be evaluated as part of the Data Gap Type II investigation.
Step 6: Specify Limits on Decision Errors
• Data Gap Type III sampling locations are based on potentially impacted storm drains, and final selection of sampling locations will be made after concurrence by Regional Water Quality Control Board, San Francisco Bay Region; therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against ecological water quality criteria accurately. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data.

Notes:

CAA Corrective action area
TTPH Total total petroleum hydrocarbons

TABLE 1-4D

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE IV
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE IV: OWSs
Step 1: State the Problem
• OWSs were identified at three CAAs. Potential releases from the OWSs and their impact to soil and groundwater are not known.
Step 2: Identify the Decisions
• Have potential releases from OWSs at identified CAAs impacted soil and groundwater at levels requiring corrective action?
Step 3: Identify Inputs to the Decision
• Historical information on past use and current status of the OWSs • Visual inspection of OWSs for evidence of releases • Analytical results from soil and groundwater samples collected near the OWS • CAP PRCs
Step 4: Define the Site Boundary
• One soil and one groundwater sample will be collected 10 feet downgradient of the OWS. • The study boundary for Data Gap Type IV is 10 feet downgradient of the OWS.
Step 5: Develop the Decision Rule
• If soil and groundwater TTPH, BTEX component, or lead concentrations do not exceed PRCs, then no further action will be conducted. • If soil TTPH, BTEX component, or lead concentrations exceed PRCs, then the area will be designated as a source area and excavated as part of the CAP strategy. • If groundwater TTPH concentrations indicate that floating product may be present, then a Data Gap Type I investigation will be conducted. • If groundwater TTPH or BTEX component or lead concentrations exceed PRCs, then a Data Gap Type II investigation will be conducted. No step-out samples will be collected.
Step 6: Specify Limits on Decision Errors
• Data Gap Type IV sampling locations are based the locations of known OWSs, and final selection of sampling locations will be made after concurrence by Regional Water Quality Control Board, San Francisco Bay Region; therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against soil and groundwater PRCs. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data.

Notes:

BTEX	Benzene, toluene, ethylbenzene, and xylenes
CAA	Corrective action area
CAP	Corrective action plan
OWS	Oil-water separtor
PRC	Preliminary remediation criteria
TTPH	Total total petroleum hydrocarbons

TABLE 1-4E

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE V
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE V: SOIL SOURCE AREAS
Step 1: State the Problem
• Isolated soil source areas may be present beneath or adjacent to buildings. Elevated soil concentrations in these areas may require in situ treatment of soil source areas.
Step 2: Identify the Decisions
• Are current TTPH concentrations in soil located inside of or adjacent to buildings distributed at concentrations requiring in situ corrective action?
Step 3: Identify Inputs to the Decision
• Analytical results from soil samples collected under this investigation near potential source areas within or adjacent to the buildings • Horizontal and vertical extent of source area beneath the building • Soil PRCs • Feasibility of soil source excavation within building • Cost-benefit analysis
Step 4: Define the Site Boundary
• An initial surface soil and groundwater interface soil sample will be collected adjacent to the location of the previous soil sample with elevated TTPH concentrations or the potential source area. • The study boundary for Data Gap Type V is a maximum of two step-outs from the initial sampling location that exceeds the soil source PRC. A step-out is defined as 10 feet in four directions from the previous sampling location.
Step 5: Develop the Decision Rule
• If soil TTPH concentrations from the initial sampling location do not exceed soil source PRCs, then no further action will be conducted. • If soil TTPH concentrations from the initial sampling location exceed soil source PRCs, then step-out samples will be collected in four directions (wherever applicable). • If TTPH concentrations from the initial step-out samples exceed the soil source PRCs, but the second step-out samples do not exceed soil source PRCs, then the feasibility of soil source excavation and cost-benefit analysis will be conducted to evaluate whether excavation is preferred over in situ treatment. • If TTPH concentrations exceed PRCs in samples from the second step-out samples, then in situ treatment will be evaluated in the future version of the corrective action plan. • If groundwater TTPH concentrations indicate that floating product may be present, then a Data Gap Type I investigation will be conducted.
Step 6: Specify Limits on Decision Errors
• Data Gap Type V sampling locations are based the locations of previously identified source areas; therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against soil PRCs. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors. • Cost-benefit analysis will involve a +30/-50 percent cost estimate similar to those conducted for feasibility studies and will compare: (1) in situ alternatives to remediate the entire source area and (2) excavation of the source area not beneath existing structures, with the remaining source area left in place for intrinsic biodegradation. Costs will be evaluated against potential risks caused by any contaminated soil left in place.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data. • A future study may be necessary to design the in situ corrective action alternative, if selected.

Notes:

PRC Preliminary remediation criteria
TTPH Total total petroleum hydrocarbons

TABLE 1-4F

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE VI
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE VI: CHLORINATED HYDROCARBONS IN GROUNDWATER
Step 1: State the Problem
• Investigations conducted under the IR, EBS, and UST programs in 1995 detected CHCs in groundwater at areas not currently designated as IR sites. It is unknown whether CHC plumes currently exist at these CAAs or EBS parcels. The presence of CHCs may impact UST closure or parcel transfer.
Step 2: Identify the Decisions
• Is CHC-impacted groundwater (exceeding MCLs) present at the CAAs and EBS parcels, precluding them from inclusion in the groundwater corrective action in the CAP or transfer, respectively?
Step 3: Identify Inputs to the Decision
• Analytical results from groundwater samples collected at the designated existing monitoring wells and additional Hydropunch® locations under this investigation • MCLs (Table 1-5) and ecological water quality criteria for CHCs
Step 4: Define the Site Boundary
• For CAAs, existing monitoring wells will be sampled for volatile organic compounds (including CHCs). • For EBS parcels, one direct-push groundwater sample will be collected near the boundary of each potentially impacted parcel adjacent to the known CHC-impacted parcel. No step-out samples will be collected.
Step 5: Develop the Decision Rule
• For CAAs, if CHC concentrations in monitoring wells exceed MCLs, then groundwater at the CAA will be referred to and addressed under the IR program. • For CAAs, if CHC concentrations in monitoring wells do not exceed MCLs, then groundwater will be addressed under the CAP. • For EBS parcels, if CHC concentrations in groundwater samples exceed MCLs, then the parcels will be referred to the IR Program and additional groundwater samples may be collected under the IR Program to delineate the extent of CHC-impacted groundwater. • For EBS parcels, if CHC concentrations in groundwater samples do not exceed MCLs, then no further action will be conducted.
Step 6: Specify Limits on Decision Errors
• Data Gap Type VI CAA sampling locations are based on existing monitoring wells where CHCs were detected in previous samples. EBS parcel sampling locations are based on proximity to the location of a known CHC plume and will only be used to determine the presence of CHCs in groundwater at potentially impacted EBS parcels. Therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against ecological water quality criteria accurately. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data. • Additional study under a different program may be required for the EBS parcels if CHCs are detected.

Notes:

CAA	Corrective action area	IR	Installation Restoration
CAP	Corrective action plan	MCL	Maximum contaminant level
CHC	Chlorinated hydrocarbons	UST	Underground storage tank
EBS	Environmental baseline survey		

TABLE 1-4G

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE VII
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE VII: MTBE MIGRATION IN GROUNDWATER
Step 1: State the Problem
• MTBE was not sampled in previous groundwater samples collected from the two former service stations at Alameda Point (corrective action areas 7 and 4C). It is unknown whether MTBE is present in groundwater and whether it is migrating off site.
Step 2: Identify the Decisions
• Is MTBE in groundwater migrating off site at concentrations that pose a risk to human and ecological receptors? • Note that the storm drain exposure pathway is concurrently evaluated under Data Gap Type II.
Step 3: Identify Inputs to the Decision
• Analytical results from groundwater samples collected at upgradient and downgradient monitoring wells • Maximum contaminant levels and ecological water quality criteria (PRCs) for MTBE • Local geologic and hydrogeologic data
Step 4: Define the Site Boundary
• Groundwater samples will be collected at one upgradient and multiple downgradient monitoring wells. • The study boundary for Data Gap Type VII is one step-out from the most upgradient or downgradient sampling location with MTBE concentrations exceeding PRCs. A step-out is defined as a distance of 100 feet upgradient for the initial upgradient monitoring well and 100 feet downgradient for the initial downgradient monitoring wells. Crossgradient samples will be collected from along each step-out row of sampling locations.
Step 5: Develop the Decision Rule
• If MTBE is not detected at concentrations exceeding its PRC, then no further sampling will be conducted. • If MTBE is detected at concentrations exceeding its PRC, then step-out Hydropunch® samples will be collected. Step-out samples (including crossgradient samples) will be collected until MTBE concentrations detected are below PRCs.
Step 6: Specify Limits on Decision Errors
• Data Gap Type VII sampling locations are based on existing monitoring wells located upgradient and downgradient of the likely release areas, and final selection of sampling locations will be made after concurrence by Regional Water Quality Control Board, San Francisco Bay Region. Therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against PRCs accurately. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data.

Notes:

MTBE Methyl tertiary-butyl ether
PRC Preliminary remediation criteria

TABLE 1-4H

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE VIII
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE VIII: CURRENT PCB SOIL CONCENTRATIONS
Step 1: State the Problem
• Aroclor 1260 was detected at a concentration slightly above its residential PRG in a shallow soil sample collected at environmental baseline survey Parcel 138, and no additional soil samples were available to assess the risk to human health and the environment.
Step 2: Identify the Decisions
• Are PCBs present in soil around the original sampling location at current concentrations that pose unacceptable risk to human health and the environment?
Step 3: Identify Inputs to the Decision
• Analytical results from soil samples collected near the original soil sample with an elevated Aroclor 1260 concentration • Region IX residential 1999 PRG for PCBs (0.22 mg/kg) • Historical information on past use and current status of PCBs in the area
Step 4: Define the Site Boundary
• An initial shallow soil sample collected at 0.5 to 1 and 2.5 to 3.0 feet bgs will be collected next to the original soil sample to confirm whether elevated PCB concentrations are present in this area. • The study boundary for Data Gap Type VIII is a maximum of two step-outs from the initial sampling location that exceeds the soil source PRG. A step-out is defined as 10 feet at the same depth intervals in four directions from the previous sampling location. No more than two sets of step-out samples will be collected.
Step 5: Develop the Decision Rule
• If PCB concentrations from the initial soil sample do not exceed residential PRGs, then no further action will be conducted. • If PCB concentrations from the initial soil sample exceed residential PRGs, then additional step-out samples will be conducted.
Step 6: Specify Limits on Decision Errors
• Data Gap Type VIII sampling locations are based the original sampling location with an elevated PCB concentration. Therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against Region IX residential PRGs for PCBs. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data. • Additional study may be necessary if elevated PCB concentrations are suspected beyond the two sets of step-out samples or are suspected deeper than 3 feet bgs.

Notes:

bgs Below ground surface
PCB Polychlorinated biphenyl
PRG Preliminary remediation goal

TABLE 1-4I

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE IX
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE IX: SOIL AND GROUNDWATER CONTAMINATION FROM FUEL LINES
Step 1: State the Problem
• Confirmation samples were not collected at all portions of the fuel lines removed during the fuel line removal action. In addition, soil and groundwater samples with elevated total petroleum hydrocarbons-related constituents exceeding PRCs near storm drains were not evaluated further.
Step 2: Identify the Decisions
• Do current soil TTPH, BTEX, or lead concentrations at those portions of fuel lines not previously sampled indicate the presence of soil source areas? • Do current groundwater TTPH concentrations at those portions of fuel lines not sampled indicate the presence of floating product? • Is TTPH-impacted groundwater associated with the former fuel lines infiltrating storm drains and discharging directly to surface water at concentrations that could pose unacceptable risk to ecological receptors?
Step 3: Identify Inputs to the Decision
• Results from confirmation samples collected during the fuel line removal action • Analytical results from soil and groundwater samples collected adjacent to the fuel lines where no confirmation samples were collected • Analytical results of groundwater samples collected near storm drains from additional direct-push samples • Maximum contaminant levels and ecological water quality criteria (PRCs)
Step 4: Define the Site Boundary
• Initial soil and groundwater samples will be collected from the location near the former fuel lines. • No step-outs will be conducted from either the initial soil or groundwater sampling locations.
Step 5: Develop the Decision Rule
• If soil TTPH, BTEX, or lead concentrations exceed PRCs, then the area will be identified as a soil source area for excavation. The extent of the source area will be determined during the source removal. • If groundwater TTPH concentrations indicate that floating product may be present, then a Data Gap Type I investigation will be conducted. • If TTPH or BTEX concentrations in the groundwater samples do not exceed PRCs, then no further action will be conducted. • If TTPH or BTEX concentrations in groundwater samples exceed PRCs, then a storm drain investigation will be conducted on the associated storm drain under Data Gap Type II investigation.
Step 6: Specify Limits on Decision Errors
• Data Gap Type IX sampling locations are based on confirmation sampling locations with elevated TTPH concentrations near the locations of former fuel lines. Therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against PRCs. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data.

Notes:

BTEX Benzene, toluene, ethylbenzene, and xylenes
PRC Preliminary remediation criteria
TTPH Total total petroleum hydrocarbons

TABLE 1-4J

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE X
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE X: RCRA CLOSURE PLAN SAMPLING
Step 1: State the Problem
• To satisfy the RCRA closure plan for USTs 37-13 through 37-16, additional soil and groundwater samples must be collected and analyzed for VOCs and metals.
Step 2: Identify the Decisions
• Do soil TPH (purgeable and extractable range), VOCs, or lead concentrations around USTs 37-13 through 37-16 indicate the presence of RCRA unit contamination?
Step 3: Identify Inputs to the Decision
• Analytical results from soil and groundwater samples collected around USTs 37-13 through 37-16 • DTSC has not established preliminary remediation goals; however, DTSC will review VOC and metal concentrations and recommend closure or RCRA corrective measures.
Step 4: Define the Site Boundary
• Twelve soil and two groundwater samples will be collected around USTs 37-13 through 37-16. • No step-outs samples will be collected beyond the initial soil or groundwater sampling locations.
Step 5: Develop the Decision Rule
• VOC and metals concentrations will be evaluated by DTSC toxicologist for closure; if DTSC will not close USTs 37-13 through 37-16 based on the data collected under the Data Gap Type X investigation, then a corrective measures study will be negotiated with DTSC. No further action will be conducted under this Data Gap Type investigation. • If soil TPH, VOC, or lead concentrations exceed the DTSC toxicologist's recommended concentrations, then the area will be identified as a soil source area for excavation. The extent of the source area will be determined during the source removal for corrective action area 11. • No additional floating product investigation will be conducted as a result of data collected under this Data Gap Type X investigation, because a floating product investigation is already planned for this area. • A storm drain investigation will be conducted on the associated storm drain under a Data Gap Type II investigation, independent of the results from the groundwater samples collected under the Data Gap Type X investigation. • The data collected under this Data Gap Type investigation will be used to characterize the soil and groundwater around USTs 37-13 through 37-16 for the purposes of site closure.
Step 6: Specify Limits on Decision Errors
• Data Gap Type X sampling locations are based on requirements of the RCRA closure plan for USTs 37-13 through 36-16. Therefore, no statistical analysis of existing data is considered to be necessary. • Detection limits were defined in the RCRA closure plan. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data and RCRA requirements.

Notes:

DTSC	Department of Toxic Substances Control
RCRA	Resource Conservation and Recovery Act
TPH	Total petroleum hydrocarbons
UST	Underground storage tank
VOC	Volatile organic compound

TABLE 1-4K

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE XI
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE XI: CONFIRMATION OF METALS CONCENTRATION IN GROUNDWATER
Step 1: State the Problem
• During the Phase II EBS investigation conducted at Parcel 27, elevated concentrations of metals were detected in groundwater. Parcel 27 cannot be transferred until the elevated metals concentrations in groundwater are addressed. However, groundwater samples were not filtered in the field prior to analysis and may have biased the metals concentrations high. Filtered groundwater samples represent bioavailable metals concentrations.
Step 2: Identify the Decisions
• Do metals concentrations in filtered groundwater samples at Parcel 27 indicate a potential risk to human health and ecological receptors?
Step 3: Identify Inputs to the Decision
• Analytical results from filtered groundwater samples collected around the NARF corrosion control facility • Ecological water quality criteria
Step 4: Define the Site Boundary
• Five soil and groundwater samples will be collected around the NARF corrosion control facility, where the previous groundwater samples with elevated metals concentrations were collected. • No step-outs will be conducted from either the initial soil or groundwater sampling locations.
Step 5: Develop the Decision Rule
• If metals concentrations in the filtered groundwater samples do not exceed tiered screening criteria for selection of chemicals of potential concern (COPCs) for human health[a], then no further action will be conducted and Parcel 27 will be submitted for transfer. • If metals concentrations exceed tiered screening criteria for selection of COPCs for human health[a], then a risk assessment or remedial action will be considered for groundwater at Parcel 27 (including the possibility of a land use control or groundwater use restriction) as part of the finding of suitability for transfer process.
Step 6: Specify Limits on Decision Errors
• Data Gap Type XI sampling locations are based on the locations of previous EBS samples collected around the building with elevated metals concentrations. • Detection limits will be at levels amenable to screening detected concentrations against ecological water quality criteria. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on known site data.

Notes:

[a] IT. 2001. "Environmental Baseline Survey, Data Evaluation Summaries." January.
COPC Chemical of potential concern
EBS Environmental baseline survey
NARF Naval Air Rework Facility

TABLE 1-4L

DATA QUALITY OBJECTIVE STEPS FOR DATA GAP TYPE XII
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP TYPE XII: 1,4-DIOXANE IN GROUNDWATER
Step 1: State the Problem
• During the OU-3 data gap investigation, 1,4-dioxane was detected at seven surface flux sampling locations at concentrations between 3.2 and 6.9 micrograms per cubic meter. However, 1,4-dioxane was not included as a target analyte in groundwater during the previous investigations at OU-3. Additional data is required to assess the potential risk to ecological receptors in San Francisco Bay (Bay) posed by 1,4-dioxane in groundwater before the FS for OU-3 can proceed.
Step 2: Identify the Decisions
• Are current concentrations of 1,4-dioxane in groundwater discharging to the bay at levels posing potentially unacceptable risk to ecological receptors?
Step 3: Identify Inputs to the Decision
• Analytical results from groundwater samples collected from existing monitoring wells located within the OU-3 boundary • ERV for 1,4-dioxane (5,470 µg/L)[a]
Step 4: Define the Site Boundary
• One groundwater sample will be collected from each of 10 existing monitoring wells screened in the first water-bearing zone and located within the OU-3 boundary. • No step-outs groundwater samples will be collected
Step 5: Develop the Decision Rule
• If 1,4-dioxane concentrations in groundwater samples do not exceed its ERV, then no further action will be conducted for 1,4-dioxane. • If 1,4-dioxane concentrations exceed its ERV, then an ecological risk assessment will be conducted. A remedial action will be considered for 1,4-dioxane in groundwater in the OU-3 FS if the risk assessment indicates that 1,4-dioxane in groundwater at OU-3 poses unacceptable risk to ecological receptors.
Step 6: Specify Limits on Decision Errors
• Data Gap Type XII sampling locations are based on the locations of existing monitoring wells that are currently used to assess groundwater concentrations of chemicals potentially discharging to the Bay; therefore no statistical analysis of existing data is considered to be necessary. • Detection limits will be at levels amenable to screening detected concentrations against ecological water quality criteria. • Data quality objectives in the form of precision and accuracy are designed to minimize analytical errors.
Step 7: Optimize the Design
• The investigation has been optimized based on available monitoring locations and hydrogeologic conditions.

Notes:

[a] Johnson,R., J.Tietge, G.Stokes, and D.Lothenbach. 1993. The Medaka Carcinogenesis Model. Technical Report 9306, Compendium of the FY1988 & FY1989 Research Reviews for the Research Methods Branch, U.S. Army Biomedical Research & Development Lab., Ft. Detrick, Frederick, MD:147-172 (U.S. NTIS AD-A272667)

Bay San Francisco Bay
ERV Ecological reference value
FS Feasibility study
µg/L Micrograms per liter
OU Operable unit

TABLE 1-5

MAXIMUM CONTAMINANT LEVELS
OF CHLORINATED HYDROCARBONS
ALAMEDA POINT, ALAMEDA CALIFORNIA
(Page 1 of 1)

Constituent	MCL (mg/L)
1,1,1-Trichloroethane	0.2
1,1,2,2-Tetrachloroethane	no value
1,1,2-Trichloroethane	0.005
1,1-Dichloroethane	0.005
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.0005
1,2-Dichloropropane	0.005
Bromodichloromethane	0.1
Carbon tetrachloride	0.0005
Chlorobenzene	0.07
Chloroethane	no value
Chloroform	0.1
Chloromethane	no value
Cis-1,2-Dichloroethene	0.006
Cis-1,3-Dichloropropene	0.0005
Dibromochloromethane	0.1
Methylene chloride	0.005
Tetrachloroethene	0.005
Trans-1,2-Dichloroethene	0.006
Trans-1,3-Dichloropropene	0.0005
Trichloroethene	0.005
Vinyl chloride	0.0005

Notes:

MCL Maximum contaminant level
mg/L Milligrams per liter

2.0 FIELD INVESTIGATION PROCEDURES

This Section describes the general field procedures used to address the 12 data gap types outlined in Section 1.5 and in the DQO tables (see Tables 1-4A through 1-4L). Specific equipment and procedures for each data gap type are discussed in Section 6.0 of the Field Sampling Plan Data Gap Investigation at Corrective Action Areas (FSP) (TtEMI 2000d). Although the title of the FSP indicates only CAAs, the FSP addresses all of the locations discussed in this report. The FSP provides additional detail on the selection of sampling locations to ensure that such locations are representative and consistent with the DQOs in Tables 1-4A through 1-4L.

2.1 DATA GAP TYPE I - FLOATING PRODUCT

TtEMI investigated the presence and distribution of floating product (defined as > 0.1 inch nonaqueous-phase liquid) at 11 CAAs where elevated TTPH concentrations (above 20 mg/L) were detected in groundwater or where floating product was observed during UST excavation and removal. Field activities were recorded in logbooks (see Appendix A) and included: (1) advancing soil borings to a depth of 10 feet below ground surface (bgs); (2) logging lithology and any staining observed in the soil cores (see Appendix B); (3) identifying the top of the capillary fringe and water table; (4) installing piezometers; (5) allowing piezometers to recharge for a 24-hour period; (6) measuring floating product, depth to groundwater, and physio-chemical parameters at piezometer locations (see Appendix C); (7) installing additional piezometers based on step-out criteria; and (8) collecting groundwater samples at piezometer locations where no floating product was encountered. Groundwater samples were analyzed for TPH, TPH-associated compounds, and MNA parameters. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. Quality assurance (QA) and quality control (QC) samples were collected, as directed in the Quality Assurance Project Plan [QAPP] Data Gap Investigation at Corrective Action Areas (TtEMI 2000e).

2.2 DATA GAP TYPE II - STORM DRAIN EXPOSURE PATHWAY

TtEMI investigated storm drains at CAAs where TTPH or TPH-associated compound concentrations in groundwater samples collected near storm drains exceeded PRCs. Storm drains were not sampled if the pipeline was above the groundwater table. Field activities were recorded in logbooks (see Appendix A) and included: sealing off sections of the storm drain system, pumping water from the upstream side of the sealed-off section to the downstream manhole or catch basin, measuring the rate of infiltrating

groundwater, and sampling groundwater that infiltrated into the sealed-off section. Groundwater samples were analyzed for TPH and TPH-associated compounds. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected, as directed in the QAPP.

2.3 DATA GAP TYPE III - CURRENT GROUNDWATER TOTAL TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS NEAR STORM DRAINS

TtEMI investigated whether groundwater TPH and TPH-associated compound concentrations exceeded PRCs near storm drains at six CAAs. These locations were identified, because insufficient data were available to assess whether the storm drains act as preferential pathways for contaminated groundwater to reach surface water. Groundwater samples were collected from existing monitoring wells using direct-push techniques. Monitoring wells were purged and floating product, depth to groundwater, and physio-chemical parameters were measured prior to collecting a groundwater sample (see Appendix C). At direct-push sampling locations, a soil boring was advanced to a foot below the soil-groundwater interface; lithology and any staining in the soil borings were logged (see Appendix B), a temporary piezometer was installed and a groundwater sample was collected. No step-out sampling was conducted under Data Gap Type III. Field activities were recorded in logbooks (see Appendix A). Groundwater samples were analyzed for TPH and TPH-associated compounds. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected as directed in the QAPP. If floating product was encountered during the Data Gap Type III investigation, then a Data Gap Type I investigation was conducted. If TPH or TPH-associated compound concentrations exceeded PRCs and CHCs are not present in groundwater, then the corresponding nearby storm drains were investigated under Data Gap Type II.

2.4 DATA GAP TYPE IV - OIL-WATER SEPARATORS

TtEMI investigated nine OWSs located within three CAAs to determine their potential impact on soil and groundwater. OWSs were identified on NAS Alameda design drawings. Each OWS was first visually inspected for evidence of petroleum releases. If an impact was suspected, then direct-push techniques were used to collect soil and groundwater samples adjacent to the OWS in the downgradient direction. At direct-push sampling locations, a soil boring was advanced to a foot below the soil-groundwater interface, lithology and any staining in the soil borings were logged (see Appendix B), soil samples were collected directly above and 1 foot below the soil-groundwater interface, a temporary piezometer was installed, and a groundwater sample was collected. Field activities were recorded in logbooks (see Appendix A).

Samples were analyzed for TPH and TPH-associated compounds. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected as directed in the QAPP. If floating product was encountered during the Data Gap Type IV investigation, then a Data Gap Type I investigation was conducted. If TPH or TPH-associated compound concentrations exceeded PRCs and CHCs are not present in groundwater, then the corresponding nearby storm drains were investigated under Data Gap Type II.

2.5 DATA GAP TYPE V - SOIL SOURCE AREAS

TtEMI investigated isolated source areas beneath structures at four CAAs and one EBS parcel. Direct-push techniques were used to collect soil and groundwater samples. At each sampling location, a soil boring was advanced to a foot below the soil-groundwater interface, lithology and any staining in the soil core were logged (see Appendix B), soil samples were collected directly above and 1 foot below the soil-groundwater interface or at the same depth interval where contamination was historically detected, a temporary piezometer was installed, and a groundwater sample was collected (at selected sampling locations). Field activities were recorded in logbooks (see Appendix A). Samples were analyzed for TPH and TPH-associated compounds. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected as directed in the QAPP. If TPH or TPH-associated compound levels exceeded PRCs, then four step-out samples were collected 10 feet from the previous sample in radial directions at the same depth intervals. If floating product was encountered during the Data Gap Type V investigation, then a Data Gap Type I investigation was conducted.

2.6 DATA GAP TYPE VI - CHLORINATED HYDROCARBONS IN GROUNDWATER

TtEMI investigated whether CHCs are present in groundwater at three CAAs and three EBS parcels. Groundwater samples were collected from existing monitoring wells using direct-push techniques. Monitoring wells were purged and depth to groundwater and physio-chemical parameters were measured prior to collecting a groundwater sample (see Appendix C). At direct-push sampling locations, a soil boring was advanced to a foot below the soil-groundwater interface, lithology and any staining in the soil borings were logged (see Appendix B), a temporary piezometer was installed, and a groundwater sample was collected. Field activities were recorded in logbooks (see Appendix A). No step-out sampling was conducted under Data Gap Type VI. Groundwater samples were analyzed for VOCs. QA/QC samples were collected as directed in the QAPP.

2.7 DATA GAP TYPE VII - METHYL TERTIARY BUTYL ETHER MIGRATION IN GROUNDWATER

TtEMI investigated the presence and migration of MTBE at two former service stations located within CAAs 7 and 4. Groundwater samples were collected from one upgradient and multiple downgradient wells at each area. Monitoring wells were purged and depth to groundwater and physio-chemical parameters were measured prior to collecting a groundwater sample (see Appendix C). Field activities were recorded in logbooks (see Appendix A). Groundwater samples were analyzed for VOCs. QA/QC samples were collected as directed in the QAPP. If MTBE levels exceeded the PRC, then step-out samples were collected from monitoring wells farther upgradient or downgradient. If MTBE levels exceeded the PRC in the farthest upgradient or downgradient monitoring wells, then step-out direct-push samples were collected 100 feet from the monitoring well and were spaced at intervals crossgradient to the plume. At direct-push sampling locations, a soil boring was advanced to a foot below the soil-groundwater interface, lithology and any staining in the soil borings were logged (see Appendix B), a temporary piezometer was installed, and a groundwater sample was collected. If MTBE levels exceeded the PRC in the vicinity of a storm drain, and CHCs are not present in groundwater, then the corresponding nearby storm drains were investigated under Data Gap Type II.

2.8 DATA GAP TYPE VIII - CURRENT POLYCHLORINATED BIPHENYL SOIL CONCENTRATIONS

TtEMI investigated PCB levels at CAA 11. Direct-push techniques were used to evaluate current levels and the lateral extent of contamination. Field activities were recorded in logbooks (see Appendix A) and included, advancing a soil boring to 4 feet bgs, logging lithology and any staining observed in the soil core (see Appendix B), and collecting soil samples from depths of 0.5 to 1 foot bgs and 2.5 to 3.0 feet bgs. Soil samples were analyzed for PCBs. QA/QC samples were collected as directed in the QAPP. If PCB levels exceeded the residential EPA Region IX 1999 PRG, then four step-out samples were collected 10 feet from the previous sample in radial directions at the same depth intervals.

2.9 DATA GAP TYPE IX - SOIL AND GROUNDWATER CONTAMINATION FROM FUEL LINES

TtEMI investigated potential soil and groundwater contamination near fuel lines where: (1) no confirmation samples were previously collected or (2) previous confirmation samples indicated the potential for impacted groundwater to migrate through storm drains to surface water. Soil and groundwater samples were collected as described in the following subsections.

2.9.1 Soil and Groundwater Sample Collection Adjacent to Former Fuel Lines

Soil and groundwater samples were collected at about 200-foot intervals along former fuel lines where no confirmation samples were collected during removal. Samples were collected 5 feet from the former fuel line location using direct-push techniques. Field activities were recorded in logbooks (see Appendix A) and included: (1) advancing soil borings to a depth of 10 feet bgs; (2) logging lithology and any staining observed in the soil cores (see Appendix B); (3) identifying the top of the capillary fringe and water table; (4) collecting soil samples at depths of 3 to 3.5 feet bgs and 1 to 1.5 feet below the capillary fringe; (5) installing piezometers; (6) collecting groundwater samples; (7) allowing piezometers to recharge for a 24-hour period; and measuring floating product, depth to groundwater, and (8) physio-chemical parameters at piezometer locations (see Appendix C). Soil and groundwater samples were analyzed for TPH and TPH-associated compounds. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected as directed in the QAPP. If floating product was encountered during the Data Gap Type IX investigation, then a Data Gap Type I investigation was conducted. If TPH or TPH-associated compound concentrations exceeded PRCs and CHCs are not present in groundwater, then the corresponding nearby storm drains were investigated under Data Gap Type II.

2.9.2 Groundwater Sample Collection Adjacent to Storm Drain Lines

Groundwater samples were collected using direct-push techniques at locations where previous confirmation samples indicated the potential for impacted groundwater to intersect storm drains. Field activities were recorded in logbooks (see Appendix A) and included: advancing soil borings to a depth of 8 feet bgs, logging lithology and any staining observed in the soil cores (see Appendix B), identifying the top of the capillary fringe and water table, installing piezometers, and collecting groundwater samples. Groundwater samples were analyzed for TPH and TPH-associated compounds. Lead samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected as directed in the QAPP. If floating product was encountered during the Data Gap Type IX investigation, then a Data Gap Type I investigation was conducted. If TPH or TPH-associated compound concentrations exceeded PRCs and CHCs are not present in groundwater, then the corresponding nearby storm drains were investigated under Data Gap Type II.

2.10 DATA GAP TYPE X - RESOURCE CONSERVATION AND RECOVERY ACT CLOSURE PLAN SAMPLING

TtEMI collected additional soil and groundwater samples near former USTs 37-13 through 37-16 (CAA 11) to meet RCRA closure requirements. Samples were collected using direct-push techniques. Field activities were recorded in logbooks (see Appendix A) and included: advancing soil borings to a depth of 8 feet bgs, logging lithology and any staining observed in the soil cores (see Appendix B), identifying the top of the capillary fringe and water table, collecting soil samples at depths of 4 to 4.5 feet bgs, and installing piezometers and collecting groundwater samples (at 2 of the 12 direct-push sampling locations). No step-out soil and groundwater samples were collected. Soil and groundwater samples were analyzed for VOCs, MTBE, and EPA Contract Laboratory Program (CLP) metals. CLP metals groundwater samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump. QA/QC samples were collected as directed in the QAPP.

TtEMI also collected additional soil samples near former UST 615-4 (CAA 5) to meet RCRA closure requirements. Samples were collected using direct-push techniques. Field activities were recorded in logbooks (see Appendix A) and included: advancing soil boring to a depth of 6 feet bgs, logging any staining observed in the soil cores, and collecting soil samples from depths of 4 to 4.5 feet bgs. No step-out soil samples were collected. Soil samples were analyzed for SVOCs, total purgeable petroleum hydrocarbons, and total extractable petroleum hydrocarbons. QA/QC samples were collected as directed in the QAPP.

2.11 DATA GAP TYPE XI - CONFIRMATION OF METALS CONCENTRATION IN GROUNDWATER

TtEMI investigated the presence of bioavailable metals in groundwater near the Naval Air Rework Facility corrosion control facility in Parcel 27A. Groundwater samples were collected using direct-push techniques at locations where previous confirmation samples indicated elevated metal concentrations. Field activities were recorded in logbooks (see Appendix A) and included advancing the direct-push probe until the groundwater table was encountered and installing a piezometer and collecting a groundwater sample at 1 to 2 feet below the groundwater table. No step-out groundwater samples were collected. Groundwater samples were filtered in the field to 0.45 microns using an inline filter apparatus and peristaltic pump and analyzed for CLP metals. QA/QC samples were collected as directed in the QAPP.

2.12 DATA GAP TYPE XII - 1,4-DIOXANE IN GROUNDWATER

TtEMI investigated the presence of 1,4-dioxane in groundwater at OU-3. 1,4-Dioxane was reported at seven surface flux sampling locations; however, it was not included as a target analyte for groundwater during previous investigations. Groundwater samples were collected at existing monitoring well locations. Monitoring wells were purged and depth to groundwater and physio-chemical parameters were measured prior to collecting groundwater samples (see Appendix C). Field activities were recorded in logbooks (see Appendix A). Groundwater samples were analyzed for VOCs. QA/QC samples were collected as directed in the QAPP.

3.0 CORRECTIVE ACTION AREAS

The following subsections provide background information and summarize the data gap investigation conducted at each CAA. Background information for each CAA includes site location and operations conducted (International Technology Corporation [IT] 1998), UST-specific information (TtEMI 2000c), proposed land reuse (Alameda Redevelopment and Reuse Authority 1996), proposed groundwater designation (TtEMI 2000f), and previous investigations. Figures and tables cited in the text appear at the end of each subsection. CAPs, with a detailed discussion of the previous investigations and nature and extent of TPH contamination at each CAA, are currently being drafted. Data gap results presented in this section will be used to evaluate remedial alternatives in the CAPs.

3.1 CORRECTIVE ACTION AREA 1

The following subsections provide a brief summary of (1) the site location and operation conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 1.

3.1.1 Site Location and Operations Conducted

CAA 1 is located in the Western Landfill Zone (Zone 1) and includes Building 442. Building 442 served as a guard and watchtower. CAA 1 contained UST 442-1. UST 442-1 had a capacity of 150 gallons and stored diesel fuel for a backup generator located within Building 442. No storm drains are located within CAA 1.

3.1.2 Proposed Land Reuse and Groundwater Beneficial Use

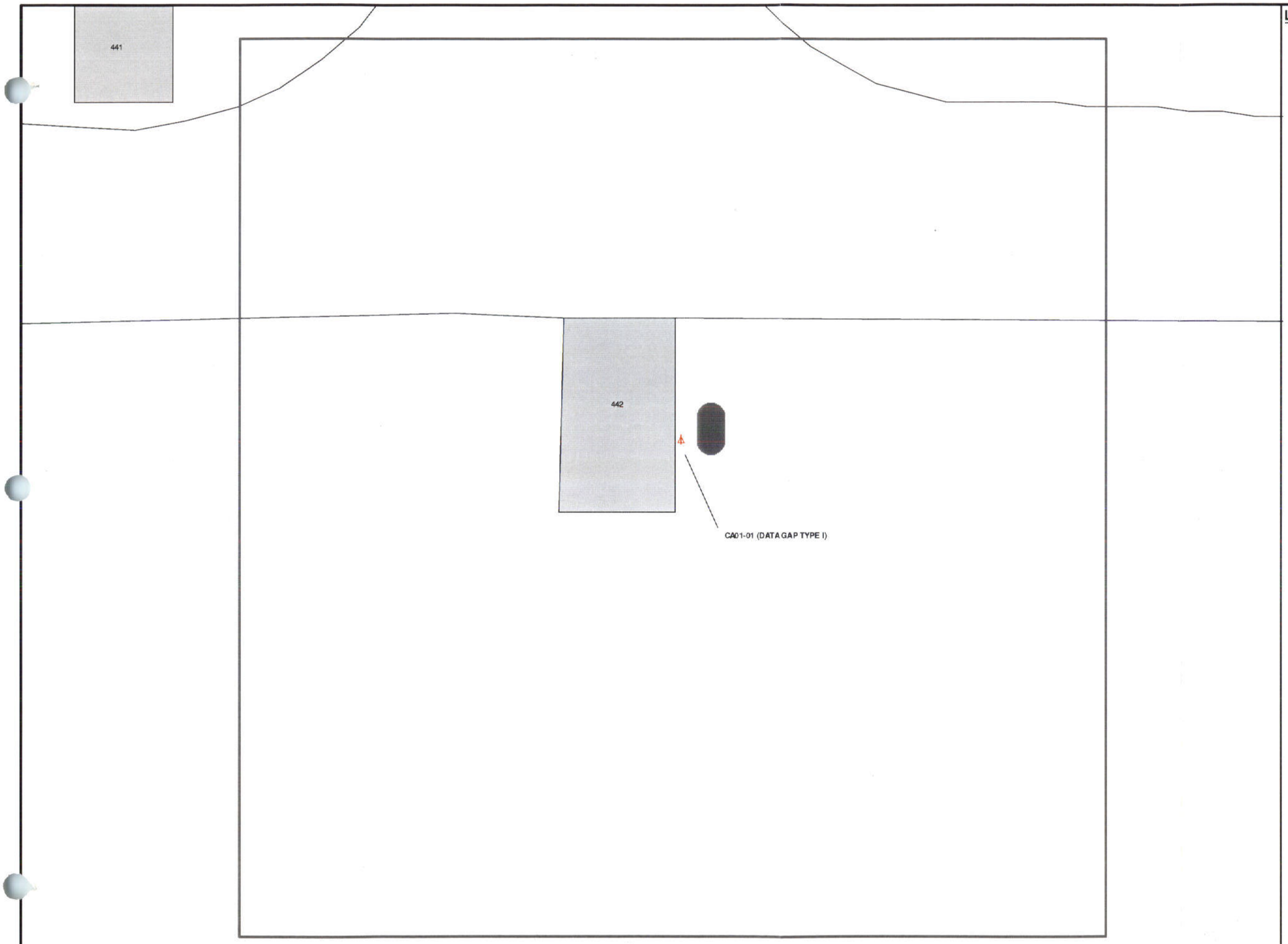
CAA 1 is designated as part of the Wildlife Refuge land reuse area. Land reuse may include an open space that will be designated as a wildlife refuge under the U.S. Fish and Wildlife Service. No development plans have considered reuse of the area for residential housing. Groundwater at CAA 1 is designated as part of the Western Region and is not considered a potential drinking water source.

3.1.3 Previous Investigations

Navy Public Works Center (PWC) removed UST 442-1 in October 1994 (PWC 1997c). In June 1995, Environmental Resources Management (ERM) conducted a groundwater investigation at the site (ERM 1996). A small, low-concentration TPH plume was delineated using the data collected under the ERM investigations. TtEMI collected one groundwater sample for MTBE analysis, directly west of the former UST in September 1999. During groundwater sample collection, a sheen was observed, indicating that floating product could be present.

3.1.4 Data Gap Investigation Summary

The presence of floating product was assessed under Data Gap Type I. No floating product was present and the TTPH concentration was less than 20 mg/L. The data gap sampling location is shown in Figure 3-1. Table 3-1 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 1 are summarized in Table 3-2 and included in Appendix D.



LEGEND

BOUNDARIES

- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLE

- FLOATING PRODUCT PIEZOMETER

SITE FEATURES

- UNDERGROUND STORAGE TANK
- BUILDING

N

5 0 5 10

SCALE: 1"= 10'

FIGURE 3-1
CORRECTIVE ACTION AREA 1
DATA GAP SAMPLING LOCATION
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-1 LAYOUT

TABLE 3-1

CORRECTIVE ACTION AREA 1
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• One soil boring was advanced to 10 feet bgs. • One piezometer was installed and checked for floating product 24 hours after installation. • One groundwater sample was collected.	• The soil boring did not have any visible staining or odors. • Depth to groundwater was 1.90 feet bgs. • No floating product was present. • The groundwater sample had a slight hydrocarbon odor, but no sheen.

Note:

bgs Below ground surface

TABLE 3-2

CORRECTIVE ACTION AREA 1
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	CA01-01
SAMPLE IDENTIFICATION	030-CAP-001
SAMPLE DATE	26-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	**0.0021**
Toluene	<0.001
Ethylbenzene	<0.001
M,P-Xylene	<0.001
O-Xylene	<0.001
Methyl Tertiary Butyl Ether	<0.002
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	<0.1
Motor-oil-range Organics	<0.5
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	<0.082
Inorganic Compounds (Dissolved)	
Lead	<0.003
Monitored Natural Attenuation Parameters	
Methane	**7.6**
Nitrate	<0.1
Chloride	**57**
Sulfate	**4.9**
Total Alkalinity	**510**
Bicarbonate Alkalinity	**510**
Carbonate Alkalinity	<5
Hydroxide Alkalinity	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.2 CORRECTIVE ACTION AREA 2

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 2.

3.2.1 Site Location and Operations Conducted

CAA 2 is located in the Northwestern Ordnance Storage Zone (Zone 2) within the boundaries of IR Site 14. No buildings are located within CAA 2. CAA 2 contained UST 357-FS1. UST 357-FS1 had a capacity of 1,000 gallons and stored diesel. A storm drain is located about 30 feet east of the location of former UST 357-FS1.

3.2.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 2 is designated as part of the Northwest Territories land reuse area. Land reuse may include offices, research and development areas, manufacturing and distribution facilities, and park areas. No development plans have considered reuse of the area for residential housing. Groundwater at CAA 2 is designated as part of the Western Region and is not considered a potential drinking water source.

3.2.3 Previous Investigations

PWC removed UST FS-1 in March 1995 (PWC 1996e). Several holes and corrosion were observed on the top and sides of the UST, and the excavation sidewalls had visible signs of contamination. A hydrocarbon odor was noted, and a sheen was observed on the groundwater within the excavation. In 1997, Moju Environmental (Moju) conducted an investigation (Moju 1998b). TTPH levels in groundwater samples collected during the Moju investigation indicated that floating product may be present (TTPH >20 mg/L) and a TPH plume may intersect the storm drain located east of former UST FS-1.

3.2.4 Data Gap Investigation Summary

The presence of floating product was assessed under Data Gap Type I. No floating product was present and the TTPH concentration was less than 20 mg/L. Current TTPH and TPH-associated compound

concentrations in groundwater near the storm drain were assessed under Data Gap Type III. TTPH concentrations were less than 1.4 mg/L and TPH-associated compound concentrations were less than AWQCs. Data gap sampling locations are shown in Figure 3-2. Table 3-3 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 2 are summarized in Tables 3-4 and 3-5 and included in Appendix D.

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 3-2 – CORRECTIVE ACTION AREA 2
DATA GAP SAMPLING LOCATIONS

FOR ADDITIONAL INFORMATION, CONTACT:

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TELEPHONE: (619) 556-1280
E-MAIL: diane.silva@navy.mil

SENSITIVE

OAKLAND INNER HARBOR

OUTFALL CC

OUTFALL W

FS1MJ-MW-1
(DATA GAP TYPE III)

357-FS1

CA02-01
(DATA GAP TYPE I)

FS1MJ-MW-4
(DATA GAP TYPE III)

355

356

357

358

359

443

S96A

S179

S96A

LEGEND

BOUNDARIES
- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLE
- FLOATING PRODUCT PIEZOMETER
- MONITORING WELL

SITE FEATURES
- UNDERGROUND STORAGE TANK
- STORM DRAIN LINE
- BUILDING

N

30 0 30 60

SCALE: 1"= 60'

FIGURE 3-2
CORRECTIVE ACTION AREA 2
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

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SENSITIVE

TABLE 3-3

CORRECTIVE ACTION AREA 2
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• One soil boring was advanced to 10 feet bgs. • One piezometer was installed and checked for floating product 24 hours after installation. • One groundwater sample was collected.	• The soil boring did not have any visible staining; however an odor was noted, and concentrations of 729, 14.4, and 0.9 parts per million, were measured on a photoionization detector at depths of 3.5, 7.0, and 10.0 feet bgs, respectively. • Depth to groundwater was 4.3 feet bgs. • No floating product was present. • The groundwater sample had a hydrocarbon odor, but no sheen.
Data Gap Type III: Current Groundwater Total Total Petroleum Hydrocarbons Concentrations Near Storm Drains	• Two groundwater samples were collected from existing monitoring wells.	• Depth to groundwater ranged from 3.06 to 5.16 feet bgs. • Groundwater samples did not have an odor or sheen.

Notes:

bgs Below ground surface

TABLE 3-4

CORRECTIVE ACTION AREA 2
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	CA02-01
SAMPLE IDENTIFICATION	030-CAP-002
SAMPLE DATE	26-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	<0.0005
Toluene	<0.001
Ethylbenzene	<0.001
M,P-Xylene	**0.0008**
O-Xylene	**0.0007**
Methyl Tertiary Butyl Ether	<0.002
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	**0.89**
Motor-oil-range Organics	<0.5
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	**1.4**
Inorganic Compounds (Dissolved)	
Lead	**0.008**
Monitored Natural Attenuation Parameters	
Methane	**0.15**
Nitrate	<0.2
Chloride	**1,400**
Sulfate	<1
Total Alkalinity	**580**
Bicarbonate Alkalinity	**580**
Carbonate Alkalinity	<5
Hydroxide Alkalinity	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-5

CORRECTIVE ACTION AREA 2
DATA GAP TYPE III ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	FS1MJ-MW-1	FS1MJ-MW-4
SAMPLE IDENTIFICATION	030-CAP-004	030-CAP-005
SAMPLE DATE	26-APR-00	26-APR-00
DEPTH (feet below ground surface)		
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	<0.0005	<0.0005
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
Xylene (Total)	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5
JP5-Range Organics	<0.1	<0.1
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	<0.05	<0.05
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.3 CORRECTIVE ACTION AREA 3

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 3.

3.3.1 Site Location and Operations Conducted

CAA 3 is located in the Engine Testing and Hazardous Materials Storage Zone (Zone 17) within IR Site 3. CAA 3 includes Buildings 398 and 109 and Structure 430. CAA 3 contained USTs 398-1, 398-2, and 97a through 97e. USTs 398-1 and 398-2 each had a capacity of 10,000 and stored JP5. A possible gasoline service station may have been operated in an area south of Building 398. IR Site 3 includes Tanks 97a through 97e. Tanks 97a through 97e each had a capacity of 100,000 gallons and stored aviation gasoline. Building 109 was a gasoline truck-loading stand, and Structure 430 was an aircraft truck fueling facility. Building 109 and Structure 430 are located in the northwestern corner of CAA 3. Storm drains are located near the former tanks and near Building 109 and Structure 430.

3.3.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 3 is designated as part of the Civic Core and Marina District land reuse areas. Land reuse may include a research and development area, an industrial area, an open space/civic mall area, commercial and residential uses, civic/institutional areas, and mixed-use (which may include residential uses). Groundwater at CAA 3 is designated as part of the Southeastern Region and is considered a potential drinking water source.

3.3.3 Previous Investigations

In January 1995, ERM conducted an investigation near USTs 398-1 and 398-2 (ERM 1996). TTPH levels in groundwater samples collected directly east of USTs 398-1 and 398-2 indicate that floating product may be present (TTPH >20 mg/L). CHCs, including 1,1-dichloroethane and trichloroethene, were also detected. PWC removed USTs 398-1 and 398-2 in April 1995 (PWC 1997a). Floating product was observed on the groundwater surface of the excavation. In September 1997, Moju conducted an investigation along the storm drains located east of the former USTs (Moju 1998b). The data collected by Moju indicated that a TPH plume intersects the storm drain; however, the storm drain pipeline is above

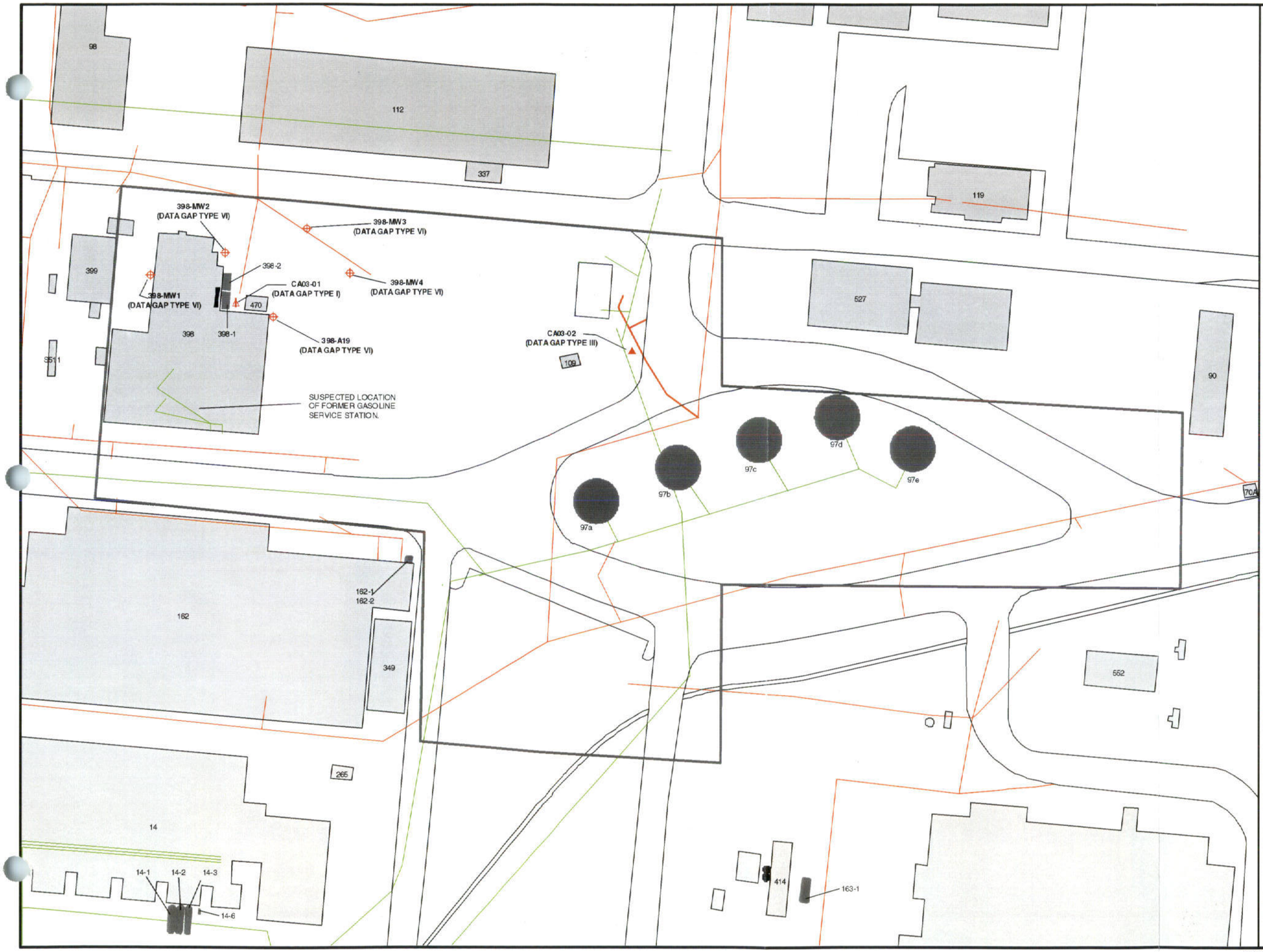
the groundwater table. Therefore, the storm drain in this area is not considered to be a potential migration pathway for contaminated groundwater to reach aquatic receptors in surface water.

In June 1995, IT conducted an EBS Phase IIa Investigation in Parcel 128, which includes Building 109 and Structure 430 (IT 1998). Elevated concentrations of TPH and TPH-associated compounds were detected in soil samples collected near the storm drain, located east of Building 109 and Structure 430. No groundwater samples were collected near the storm drain.

RI activities for IR Site 3 (Tanks 97a through 97e) were initiated in 1990 and included a soil gas survey, a soil investigation, and a groundwater investigation (TtEMI 1999b). TtEMI conducted an additional investigation in September 1999 (TtEMI 1999c). A small, low-concentration TPH plume was defined using the data collected under the TtEMI investigation.

3.3.4 Data Gap Investigation Summary

The presence of floating product near former USTs 398-1 and 398-2 was assessed under Data Gap Type I. No floating product was present and TTPH concentrations were less than 20 mg/L. Current TTPH and TPH-associated compound concentrations in groundwater near the storm drain located east of Building 109 and Structure 430 were assessed under Data Gap Type III. The TTPH concentration exceeded 1.4 mg/L and xylene (total) concentration exceeded the AWQC. All other TPH-associated compound concentrations were less than AWQCs. Based on analytical results from the Data Gap Type III sample, a Data Gap Type II investigation was also conducted. However, a groundwater sample was not collected because groundwater did not infiltrate into the storm drain reach. Under Data Gap Type V, a ground penetrating radar (GPR) survey and a metal detector survey (see Appendix E) were conducted in the southern portion of Building 398 to locate USTs that may have been associated with the possible former gasoline service station. No anomalies indicative of possible underground storage tanks were found. CHC concentrations in groundwater near Building 398 were evaluated under Data Gap Type VI. CHC concentrations did not exceed MCLs. Data gap sampling locations are shown in Figure 3-3. Table 3-6 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 3 are summarized in Tables 3-7 through 3-9 and included in Appendix D.



LEGEND

BOUNDARIES
- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES
- DIRECT-PUSH - GROUNDWATER
- FLOATING PRODUCT PIEZOMETER
- MONITORING WELL

SITE FEATURES
- BUILDING
- ABOVEGROUND STORAGE TANK
- UNDERGROUND STORAGE TANK
- FUEL LINE
- STORM DRAIN LINE
- INVESTIGATED STORM DRAIN LINE

N

50 0 50 100

SCALE: 1"= 100'

FIGURE 3-3
CORRECTIVE ACTION AREA 3
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-3 LAYOUT

TABLE 3-6

CORRECTIVE ACTION AREA 3
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 2)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• One soil boring was advanced to 10 feet bgs. • One piezometer was installed and checked for floating product 24 hours after installation. • One groundwater sample was collected.	• The soil boring did not have any visible staining or odors. • Depth to groundwater was 5.35 feet bgs. • No floating product was present. • The groundwater sample had a hydrocarbon odor and a slight sheen.
Data Gap Type II: Storm Drain Exposure Pathway	• The storm drain reach located east of Building 109 and Structure 430 was investigated.	• Groundwater did not infiltrate into the storm drain reach; therefore, groundwater samples were not collected.
Data Gap Type III: Current Groundwater Total Total Petroleum Hydrocarbons Concentrations Near Storm Drains	• One soil boring was advanced to 8 feet bgs. • One groundwater sample was collected.	• The soil boring did not have any visible staining or odors. • Depth to groundwater was 5.5 feet bgs. • The groundwater sample did not have an odor or sheen.
Data Gap Type V: Soil Source Areas	• A metal detector survey was conducted. • A ground penetrating radar survey was conducted.	• No anomalies indicative of possible underground storage tanks were found (see Appendix E).
Data Gap Type VI: Chlorinated Hydrocarbons in Groundwater	• Six groundwater samples were collected from existing monitoring wells.	• Depth to groundwater ranged from 4.51 to 7.10 feet bgs. • Groundwater samples collected from MWs 398-MW4 and 398-A19 had a slight solvent odor, but no sheen. • Groundwater samples collected from MWs 398-MW1 through 398-MW3 did not have an odor or sheen.

TABLE 3-6

CORRECTIVE ACTION AREA 3
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 2)

Notes:

bgs Below ground surface
MW Monitoring well

TABLE 3-7

CORRECTIVE ACTION AREA 3
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA03-01
SAMPLE IDENTIFICATION	030-CAP-006
SAMPLE DATE	27-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	<0.0005
Toluene	<0.001
Ethylbenzene	<0.001
M,P-Xylene	<0.001
O-Xylene	<0.001
Methyl Tertiary Butyl Ether	<0.002
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	<0.1
Motor-oil-range Organics	<0.5
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	<0.05
Inorganic Compounds (Dissolved)	
Lead	<0.003
Monitored Natural Attenuation Parameters	
Methane	<0.0005
Nitrate	**0.16**
Chloride	**12**
Sulfate	**73**
Total Alkalinity	**150**
Bicarbonate Alkalinity	**150**
Carbonate Alkalinity	<5
Hydroxide Alkalinity	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-8

CORRECTIVE ACTION AREA 3
DATA GAP TYPE III ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	CA03-02
SAMPLE IDENTIFICATION	030-CAP-008
SAMPLE DATE	26-APR-00
DEPTH (feet below ground surface)	3.0 to 8.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	**0.62**
Toluene	<0.01
Ethylbenzene	<0.01
Xylene (Total)	**0.21**
Methyl Tertiary Butyl Ether	<0.02
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	<0.1
Motor-oil-range Organics	<0.5
JP5-Range Organics	<0.1
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	**4.3**
Inorganic Compounds (Dissolved)	
Lead	**0.0073**

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-9

CORRECTIVE ACTION AREA 3
DATA GAP TYPE VI ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 3)

POINT NAME	398-A19	398-A19	398-MW1
SAMPLE IDENTIFICATION	030-CAP-035	030-CAP-357	030-CAP-031
SAMPLE DATE	01-MAY-00	01-MAY-00	01-MAY-00
DEPTH (feet below ground surface)			
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
1,1,1-Trichloroethane	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethene	<0.001	<0.001	<0.001
1,2,4-Trimethylbenzene	<0.001	<0.001	<0.001
1,2-Dichloroethane	**0.0009**	**0.001**	<0.001
1,2-Dichloropropane	<0.001	<0.001	<0.001
1,3,5-Trimethylbenzene	<0.001	<0.001	<0.001
Bromodichloromethane	<0.001	<0.001	<0.001
Bromoform	<0.001	<0.001	<0.001
Bromomethane	<0.005	<0.005	<0.005
Carbon Tetrachloride	<0.001	<0.001	<0.001
Chlorobenzene	<0.001	<0.001	<0.001
Chloroethane	<0.005	<0.005	<0.005
Chloroform	<0.001	<0.001	<0.001
Chloromethane	<0.005	<0.005	<0.005
Cis-1,2-Dichloroethene	<0.001	<0.001	<0.001
Cis-1,3-Dichloropropene	<0.001	<0.001	<0.001
Dibromochloromethane	<0.001	<0.001	<0.001
Methylene Chloride	<0.002	<0.002	<0.002
Styrene	<0.001	<0.001	<0.001
Tetrachloroethene	<0.001	<0.001	**0.0005**
Trans-1,2-Dichloroethene	<0.001	<0.001	<0.001
Trans-1,3-Dichloropropene	<0.001	<0.001	<0.001
Trichloroethene	<0.001	<0.001	**0.0007**
Vinyl Chloride	<0.0005	<0.0005	<0.0005
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002

TABLE 3-9

CORRECTIVE ACTION AREA 3
DATA GAP TYPE VI ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 3)

POINT NAME	398-MW2	398-MW3	398-MW4
SAMPLE IDENTIFICATION	030-CAP-032	030-CAP-033	030-CAP-034
SAMPLE DATE	01-MAY-00	01-MAY-00	01-MAY-00
DEPTH (feet below ground surface)			
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
1,1,1-Trichloroethane	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethane	**0.0014**	<0.001	<0.001
1,1-Dichloroethene	<0.001	<0.001	<0.001
1,2,4-Trimethylbenzene	<0.001	<0.001	<0.001
1,2-Dichloroethane	<0.001	<0.001	<0.001
1,2-Dichloropropane	<0.001	<0.001	<0.001
1,3,5-Trimethylbenzene	<0.001	<0.001	<0.001
Bromodichloromethane	<0.001	<0.001	<0.001
Bromoform	<0.001	<0.001	<0.001
Bromomethane	<0.005	<0.005	<0.005
Carbon Tetrachloride	<0.001	<0.001	<0.001
Chlorobenzene	<0.001	<0.001	<0.001
Chloroethane	<0.005	<0.005	<0.005
Chloroform	<0.001	<0.001	<0.001
Chloromethane	<0.005	<0.005	<0.005
Cis-1,2-Dichloroethene	<0.001	<0.001	<0.001
Cis-1,3-Dichloropropene	<0.001	<0.001	<0.001
Dibromochloromethane	<0.001	<0.001	<0.001
Methylene Chloride	<0.002	<0.002	<0.002
Styrene	<0.001	<0.001	<0.001
Tetrachloroethene	<0.001	<0.001	<0.001
Trans-1,2-Dichloroethene	<0.001	<0.001	<0.001
Trans-1,3-Dichloropropene	<0.001	<0.001	<0.001
Trichloroethene	<0.001	<0.001	<0.001
Vinyl Chloride	<0.0005	<0.0005	<0.0005
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002

TABLE 3-9

CORRECTIVE ACTION AREA 3
DATA GAP TYPE VI ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 3 of 3)

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.4 CORRECTIVE ACTION AREA 4

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 4.

3.4.1 Site Location and Operations Conducted

CAA 4 is located in the Southeastern Refinery and Heavy Industrial Zone (Zone 22) within IR Sites 4 and 22. CAA 4 includes Buildings 163, 372, 414, and 547 (within IR Site 22). CAA 4 contained USTs 163-1, 372-1 and 372-2, and 547-1 through 547-5. UST 163-1 had a capacity of 2,000 gallons and stored fuel oil. USTs 372-1 had a capacity of 6,000 gallons and stored jet fuel. UST 372-2 had a capacity of 1,000 gallons and stored lubricating oil. IR Site 22 operated as a gasoline service station and included USTs 547-1 through 547-5. USTs 541-1 through 547-3 each had a capacity of 12,000 gallons and stored gasoline. USTs 547-4 and 547-5 stored waste oil and had capacities of 5,000 and 10,000 gallons, respectively. Storm drains are located east of Buildings 163 and west of Building 372 and IR Site 22.

3.4.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 4 is designated as part of the Inner Harbor land reuse area. Land reuse may include offices, research and development areas, mixed-use (which may include residential uses), and park areas. Groundwater at CAA 4 is designated as part of the Southeastern Region and is considered a potential drinking water source.

3.4.3 Previous Investigations

In 1995, ERM conducted an investigation near USTs 372-1 and 372-2 (ERM 1996). TTPH levels in groundwater samples collected near the USTs and south of Building 372 indicated that floating product may be present (TTPH >20 mg/L). PWC removed UST 372-1 in April 1995 (PWC 1996f). During removal, UST 372-2 was discovered directly beneath UST 372-1; however, it was left in place for future removal. UST 372-1 was reported to be in good condition, with no holes. Soil staining was not observed in the excavation sidewalls; however, a petroleum hydrocarbon odor was noted, and floating product was present on the groundwater. In September 1997, Moju conducted an investigation to evaluate the extent of a dissolved hydrocarbon plume near the USTs (Moju 1998b). In 1998, TtEMI removed UST 372-2

(TtEMI 1999g). The UST was corroded, but did not have holes other than those made during removal. A tar-like, free product was observed in the soil at the eastern end of the excavation.

In 1995, IT conducted EBS Phase IIa and IIb investigations in Parcel 134, which includes Building 163 (IT 1998). TTPH levels in soil samples collected from Building 163 indicate that two soil source areas may be present.

Five investigations were conducted at IR Site 22 (USTs 547-1 through 547-5): (1) an RI conducted by PRC Environmental Management, Inc. and Montgomery Watson between 1990 and 1998 (PRC EMI); (2) a UST and fuel line removal effort conducted by PWC in 1994 (PWC 1997g) (3) a EBS Investigation conducted by IT in 1995 (IT 1998); (4) a metal detector survey conducted by Precision Locating in 1999 (TtEMI 2000c); and (5) a floating product investigation conducted by TtEMI in October 1999 (TtEMI 2000b). During the RI investigation, CHCs were detected in groundwater north of IR Site 22. Samples collected during IR Site 22 previous investigations were not analyzed for MTBE.

3.4.4 Data Gap Investigation Summary

The presence of floating product near former USTs 372-1 and 372-2 was assessed under Data Gap Type I. No floating product was present and TTPH concentrations were less than 20 mg/L. The two source areas located beneath Building 163 were investigated under Data Gap Type V. Total lead concentrations exceeded the interim residential PRC at sampling location CA04-03. TTPH and all other TPH-associated compound concentrations did not exceed interim residential PRCs for soil. CHC concentrations in groundwater north of IR Site 22 were evaluated under Data Gap Type VI. CHC concentrations did not exceed MCLs. The presence of MTBE in groundwater at IR Site 22 was assessed under Data Gap Type VII. MTBE concentrations did not exceed the MCL. Data gap sampling locations are shown in Figure 3-4. Table 3-10 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 4 are summarized in Tables 3-11 through 3-14 and included in Appendix D.

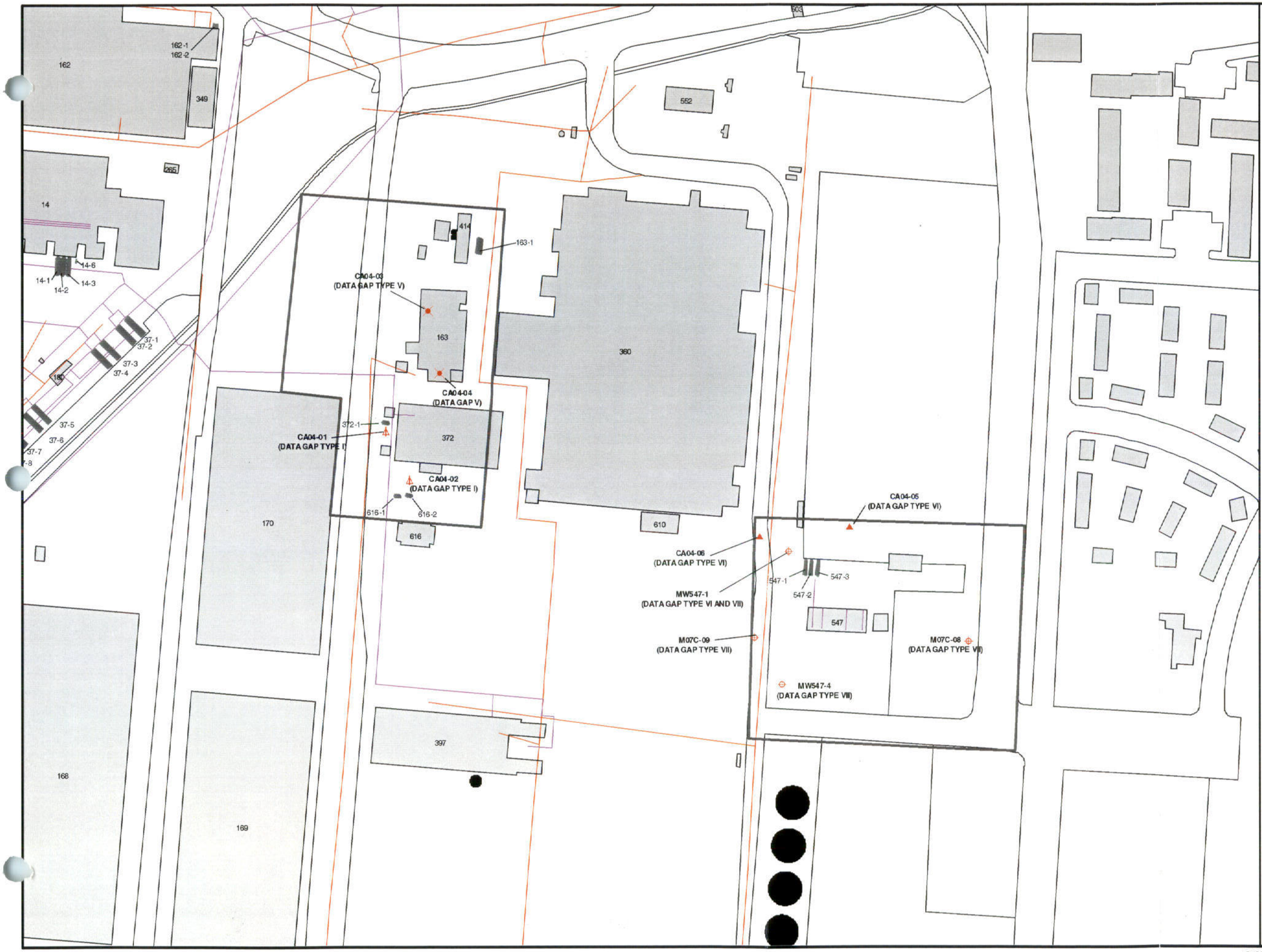


FIGURE 3-4
CORRECTIVE ACTION AREA 4
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-4 LAYOUT

TABLE 3-10

CORRECTIVE ACTION AREA 4
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• Two soil borings were advanced to 10 feet bgs. • Two piezometers were installed and checked for floating product 24 hours after installation. • Two groundwater samples were collected. • An extraction well located near the southwestern corner of Building 372 was checked for floating product.	• Soil borings did not have any visible staining or odors. • Depth to groundwater ranged from 2.15 to 4.60 feet bgs. • No floating product was present. • Groundwater samples had a hydrocarbon odor and a slight sheen. • Groundwater in the extraction well had a strong hydrocarbon odor and a thick sheen.
Data Gap Type V: Soil Source Areas	• One soil boring was advanced in the northern portion of Building 163 to 6 feet bgs. One soil sample was collected at a depth of 4.0 to 5.0 feet bgs. • One soil boring was advanced in the southern portion of Building 163 to 4 feet bgs. Two soil samples were collected at depths of 0.5 to 1.5 and 3.0 to 4.0 feet bgs.	• Soil borings did not have any visible staining or odors. • Depth to groundwater ranged from 4.0 to 5.0 feet bgs.
Data Gap Type VI: Chlorinated Hydrocarbons in Groundwater	• Five groundwater samples were collected at two direct-push locations. Groundwater samples were collected at 10 and 50 feet bgs. • One groundwater sample was collected from an exsisting monitoring well.	• None
Data Gap Type VII: Methyl Tertiary Butyl Ether Migration in Groundwater	• Four groundwater samples were collected from existing monitoring wells.	• Depth to groundwater ranged from 2.78 to 3.87 feet bgs. • Groundwater samples did not have an odor or sheen.

Notes:

bgs Below ground surface

TABLE 3-11

CORRECTIVE ACTION AREA 4
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	CA04-01	CA04-02
SAMPLE IDENTIFICATION	030-CAP-036	030-CAP-037
SAMPLE DATE	27-APR-00	27-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	<0.0005	<0.0005
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
M,P-Xylene	**0.0005**	<0.001
O-Xylene	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	<0.1	**0.11**
Motor-oil-range Organics	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	<0.084	<0.22
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003
Monitored Natural Attenuation Parameters		
Methane	**0.033**	**9.8**
Nitrate	**0.33**	<0.1
Chloride	**5.9**	**21**
Sulfate	**2.8**	**0.66**
Total Alkalinity	**36**	**500**
Bicarbonate Alkalinity	**36**	**500**
Carbonate Alkalinity	<5	<5
Hydroxide Alkalinity	<5	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-12

CORRECTIVE ACTION AREA 4
DATA GAP TYPE V ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA04-03	CA04-04	CA04-04
SAMPLE IDENTIFICATION	030-CAP-038	030-CAP-040	030-CAP-041
SAMPLE DATE	04-MAY-00	04-MAY-00	04-MAY-00
DEPTH (feet below ground surface)	4.0 to 5.0	0.5 to 1.5	3.0 to 4.0
MEDIA (Units)	Soil (mg/kg)	Soil (mg/kg)	Soil (mg/kg)
Volatile Organic Compounds			
Benzene	<0.01	<0.01	<0.01
Toluene	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01
Xylene (Total)	<0.01	<0.01	<0.01
Methyl Tertiary Butyl Ether	<0.01	<0.01	<0.01
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<10	<10	<10
Motor-oil-range Organics	<250	<250	<250
JP5-Range Organics	<10	<10	<10
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	<0.5	<0.5
Inorganic Compounds (Total)			
Lead	**2,900**	**23**	**25**

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-13

CORRECTIVE ACTION AREA 4
DATA GAP TYPE VI ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA04-05	CA04-05	CA04-06
SAMPLE IDENTIFICATION	030-CAP-058	030-CAP-059	030-CAP-060
SAMPLE DATE	27-APR-00	27-APR-00	27-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0	46.0 to 50.0	6.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
1,1,1-Trichloroethane	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethene	<0.001	<0.001	<0.001
1,2,4-Trimethylbenzene	<0.001	<0.001	<0.001
1,2-Dichloroethane	<0.001	<0.001	<0.001
1,2-Dichloropropane	<0.001	<0.001	<0.001
1,3,5-Trimethylbenzene	<0.001	<0.001	<0.001
Bromodichloromethane	<0.001	<0.001	<0.001
Bromoform	<0.001	<0.001	<0.001
Bromomethane	<0.005	<0.005	<0.005
Carbon Tetrachloride	<0.001	<0.001	<0.001
Chlorobenzene	<0.001	<0.001	<0.001
Chloroethane	<0.005	<0.005	<0.005
Chloroform	<0.001	<0.001	<0.001
Chloromethane	<0.005	<0.005	<0.005
Cis-1,2-Dichloroethene	<0.001	<0.001	<0.001
Cis-1,3-Dichloropropene	<0.001	<0.001	<0.001
Dibromochloromethane	<0.001	<0.001	<0.001
Methylene Chloride	<0.0023	<0.002	<0.002
Styrene	<0.001	<0.001	<0.001
Tetrachloroethene	<0.001	<0.001	<0.001
Trans-1,2-Dichloroethene	<0.001	<0.001	<0.001
Trans-1,3-Dichloropropene	<0.001	<0.001	<0.001
Trichloroethene	<0.001	<0.001	<0.001
Vinyl Chloride	<0.0005	<0.0005	<0.0005
Benzene	<0.0005	<0.0005	<0.0005
Toluene	**0.0006**	**0.0021**	**0.0006**
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002

TABLE 3-13

CORRECTIVE ACTION AREA 4
DATA GAP TYPE VI ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA04-06	CA04-06	MW547-1
SAMPLE IDENTIFICATION	030-CAP-360	030-CAP-061	030-CAP-062
SAMPLE DATE	27-APR-00	27-APR-00	27-APR-00
DEPTH (feet below ground surface)	6.0 to 10.0	46.0 to 50.0	
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
1,1,1-Trichloroethane	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethane	<0.001	<0.001	<0.001
1,1-Dichloroethene	<0.001	<0.001	<0.001
1,2,4-Trimethylbenzene	<0.001	<0.001	<0.001
1,2-Dichloroethane	<0.001	<0.001	<0.001
1,2-Dichloropropane	<0.001	<0.001	<0.001
1,3,5-Trimethylbenzene	<0.001	<0.001	<0.001
Bromodichloromethane	<0.001	<0.001	<0.001
Bromoform	<0.001	<0.001	<0.001
Bromomethane	<0.005	<0.005	<0.005
Carbon Tetrachloride	<0.001	<0.001	<0.001
Chlorobenzene	<0.001	<0.001	<0.001
Chloroethane	<0.005	<0.005	<0.005
Chloroform	<0.001	<0.001	<0.001
Chloromethane	<0.005	<0.005	<0.005
Cis-1,2-Dichloroethene	<0.001	<0.001	<0.001
Cis-1,3-Dichloropropene	<0.001	<0.001	<0.001
Dibromochloromethane	<0.001	<0.001	<0.001
Methylene Chloride	<0.0025	<0.002	<0.002
Styrene	<0.001	<0.001	<0.001
Tetrachloroethene	<0.001	<0.001	<0.001
Trans-1,2-Dichloroethene	<0.001	<0.001	<0.001
Trans-1,3-Dichloropropene	<0.001	<0.001	<0.001
Trichloroethene	<0.001	<0.001	<0.001
Vinyl Chloride	<0.0005	<0.0005	<0.0005
Benzene	<0.0005	<0.0005	<0.0005
Toluene	**0.0006**	**0.0015**	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002

TABLE 3-13

CORRECTIVE ACTION AREA 4
DATA GAP TYPE VI ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 3 of 3)

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-14

CORRECTIVE ACTION AREA 4
DATA GAP TYPE VII ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	M07C-08	M07C-09	MW547-1
SAMPLE IDENTIFICATION	030-CAP-063	030-CAP-065	030-CAP-064
SAMPLE DATE	27-APR-00	27-APR-00	27-APR-00
DEPTH (feet below ground surface)			
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002

TABLE 3-14

CORRECTIVE ACTION AREA 4
DATA GAP TYPE VII ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	MW547-4
SAMPLE IDENTIFICATION	030-CAP-066
SAMPLE DATE	27-APR-00
DEPTH (feet below ground surface)	
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Methyl Tertiary Butyl Ether	<0.002

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.5 CORRECTIVE ACTION AREA 5

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 5.

3.5.1 Site Location and Operations Conducted

CAA 5 is located in the Building 5 Heavy Industrial Zone and the Southern Hangar Zone (Zones 10 and 11) within IR Sites 5 and 10. CAA 5 includes Building 615, three former buildings (261, 348, and 415), and a portion of Building 400. CAA 5 contained USTs 5-2 and 5-3, 261-1 through 263-3, 615-3 and 615-4, and 400-1. UST 5-2 had a capacity of 4,000 gallons and stored JP5. UST 5-3 had a capacity of 320 gallons and stored waste oil. USTs 261-1 and 261-2 each had a capacity of 800 gallons and stored kerosene. UST 261-3 had a capacity of 1,500 gallons and stored PD-680. UST 400-1 had a capacity of 250 gallons and store diesel. UST 615-3 was an OWS and had a capacity of 50 gallons. UST 615-4 had a capacity of 80 gallons and stored waste oil from UST 615-3. Storm drains are located north of former USTs 5-2 and 400-1.

3.5.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 5 is designated as part of the Civic Core land reuse area. Land reuse may include a research and development area, an industrial workplace area, an open space/civic mall area, and mixed-use (which may include residential uses). Groundwater at CAA 5 is designated as part of the Central Region and is not considered a potential drinking water source.

3.5.3 Previous Investigations

In June 1997, UST 5-2 was removed (TtEMI 1997b). The condition of the UST was not recorded during removal; however, an oily sheen was observed on the groundwater surface within the excavation. In September 1998, IT removed a fuel line located north of former UST 5-2. TTPH levels in groundwater samples collected from the UST and fuel line excavations indicate that floating product may be present (TTPH >20 mg/L).

In September 1998, Berkeley Environmental Restoration Center (BERC) installed nine borings to evaluate the extent of floating product in the vicinity of UST 5-3 (BERC 2000). The investigation revealed a floating product plume immediately downgradient of UST 5-3 that covered an area of about 1,400 square feet and was up to 1.2 feet thick. UST 5-3 was removed in December 1998 (TtEMI 1999d). Several holes were observed in the UST and in the connecting fuel line. In 1999, BERC performed in situ, steam-enhanced, free product removal near the former UST. About 500 gallons of free product were removed. After BERC completed the steam-enhanced extraction demonstration, samples were collected from multilevel wells in August 1999 to evaluate the technology. However, post-steaming groundwater samples still contained high levels of TPH (up to 55 mg/L), indicating that floating product may still be present (TTPH >20 mg/L). CHCs were also detected in post-steaming soil and groundwater samples.

PWC removed UST 261-3 in December 1994 (PWC 1996d). TTPH levels in groundwater samples collected from the UST excavation indicated that floating product may be present (TTPH >20 mg/L).

UST 400-1 was removed in 1995 (PWC 1997b). Groundwater was not encountered in the excavation; therefore, a groundwater sample was not collected. In 1997, Moju conducted an investigation near the former UST (Moju 1998b). TTPH levels in groundwater samples collected during the Moju investigation indicated that floating product may be present (TTPH >20 mg/L).

3.5.4 Data Gap Investigation Summary

The presence of floating product near former USTs 5-2 and 5-3, 261-3, and 400-1 was assessed under Data Gap Type I. No floating product was present and TTPH concentrations were less than 20 mg/L. Data gap sampling locations are shown in Figure 3-5. Table 3-15 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 5 are summarized in Table 3-16 and included in Appendix D.

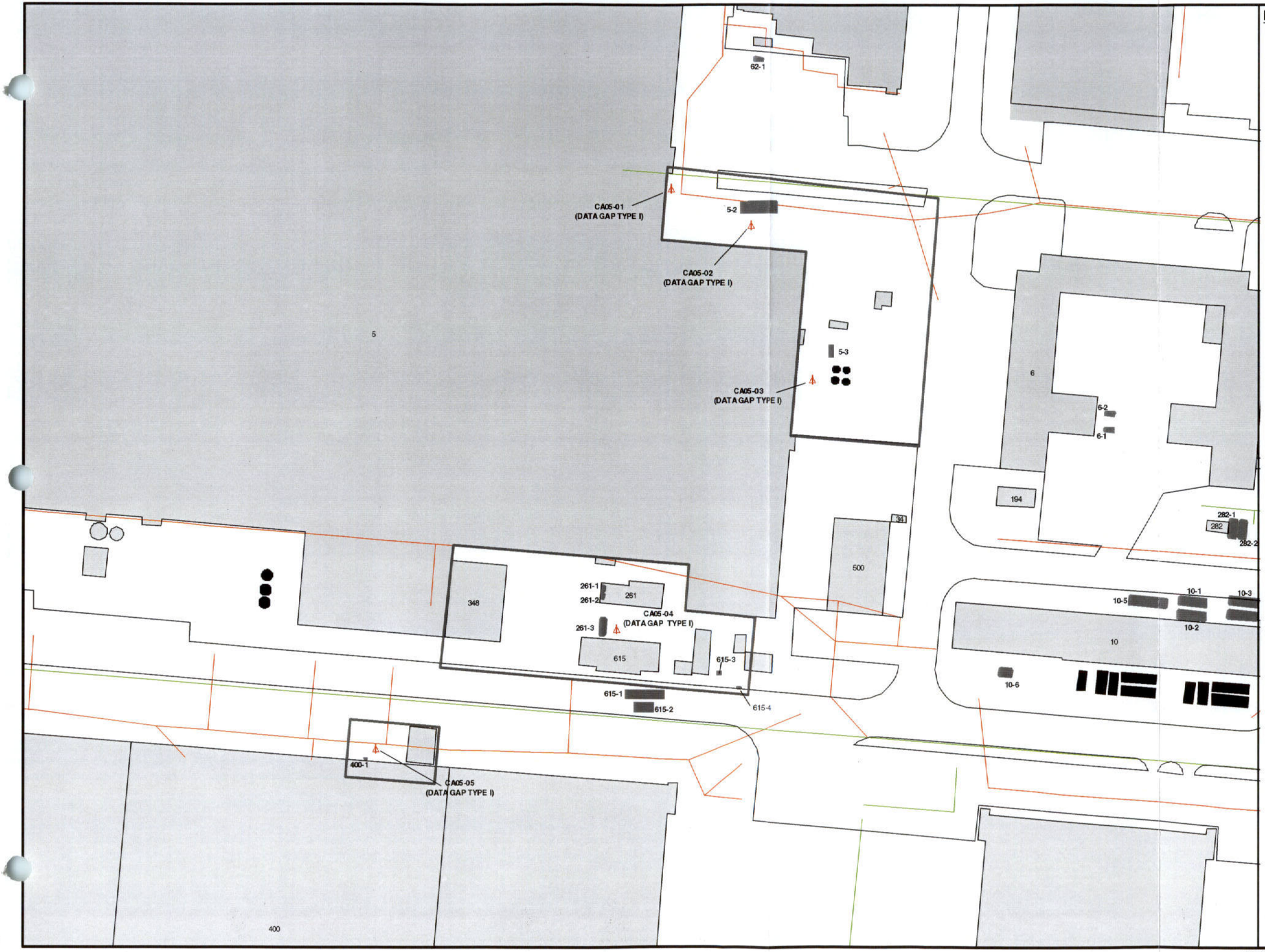


FIGURE 3-5
CORRECTIVE ACTION AREA 5
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-5 LAYOUT

TABLE 3-15

CORRECTIVE ACTION AREA 5
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• Five soil borings were advanced to 10 feet bgs. • Five piezometers were installed and checked for floating product 24 hours after installation. • Six groundwater samples were collected.	• Soil borings collected near former UST 5-2 and near the former fuel line had visible staining and a hydrocarbon odor. • Soil borings collected near former USTs 5-3, 261-3, and 400-1 did not have any visible staining or odors. • Depth to groundwater ranged from 5.30 to 7.42 feet bgs. • No floating product was present. • Groundwater samples, with the exception of the sample collected near former UST 400-1, had a solvent odor. A thick sheen was also detected on the bailer used to measure possible floating product near former UST 261-3.

Notes:

bgs Below ground surface
UST Underground storage tank

TABLE 3-16

CORRECTIVE ACTION AREA 5
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 2)

POINT NAME	CA05-01	CA05-01	CA05-02
SAMPLE IDENTIFICATION	030-CAP-067	030-CAP-361	030-CAP-068
SAMPLE DATE	10-MAY-00	10-MAY-00	10-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	**0.21**
Motor-oil-range Organics	<0.5	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.2	<0.22	<0.15
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	**6.1**	**5.3**	**0.66**
Nitrate	<0.1	<0.1	<0.1
Chloride	**890**	**860**	**4.7**
Sulfate	**240**	**280**	**3.6**
Total Alkalinity	**650**	**600**	**170**
Bicarbonate Alkalinity	**650**	**600**	**170**
Carbonate Alkalinity	<5	<5	<5
Hydroxide Alkalinity	<5	<5	<5

TABLE 3-16

CORRECTIVE ACTION AREA 5
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 2)

POINT NAME	CA05-03	CA05-04	CA05-05
SAMPLE IDENTIFICATION	030-CAP-069	030-CAP-070	030-CAP-071
SAMPLE DATE	10-MAY-00	11-MAY-00	16-JUN-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	**0.0006**	<0.0005	<0.0005
Toluene	<0.001	**0.0008**	<0.001
Ethylbenzene	<0.001	**0.003**	<0.001
M,P-Xylene	<0.001	**0.0029**	<0.001
O-Xylene	<0.001	**0.0054**	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	**0.36**	**6.4**
Motor-oil-range Organics	**0.67**	<0.5	**3**
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.075	**2.6**	<0.05
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	**6.3**	**9.6**	**2.1**
Nitrate	<0.1	<0.1	<0.1
Chloride	**65**	**4.9**	**400**
Sulfate	**61**	<0.5	**29**
Total Alkalinity	**280**	**140**	**580**
Bicarbonate Alkalinity	**280**	**140**	**580**
Carbonate Alkalinity	<5	<5	<5
Hydroxide Alkalinity	<5	<5	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.6 CORRECTIVE ACTION AREA 6

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 6.

3.6.1 Site Location and Operations Conducted

CAA 6 is located in the Western Hanger Zone (Zone 6) and includes Building 373, which operated as a fuel loading station. CAA 6 contained USTs 373-1 and 373-2. USTs 373-1 and 373-2 stored fuel and fuel-contaminated water recovered by an oil interceptor pit and had capacities of 10,000 and 2,730 gallons, respectively. Multiple storm drains are located within CAA 6.

3.6.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 6 is designated as part of the Civic Core land reuse area. Land reuse may include a research and development area, an industrial workplace area, an open space/civic mall area, and mixed-use (which may include residential uses). Groundwater at CAA 6 is designated as part of the Central Region and is not considered a potential drinking water source.

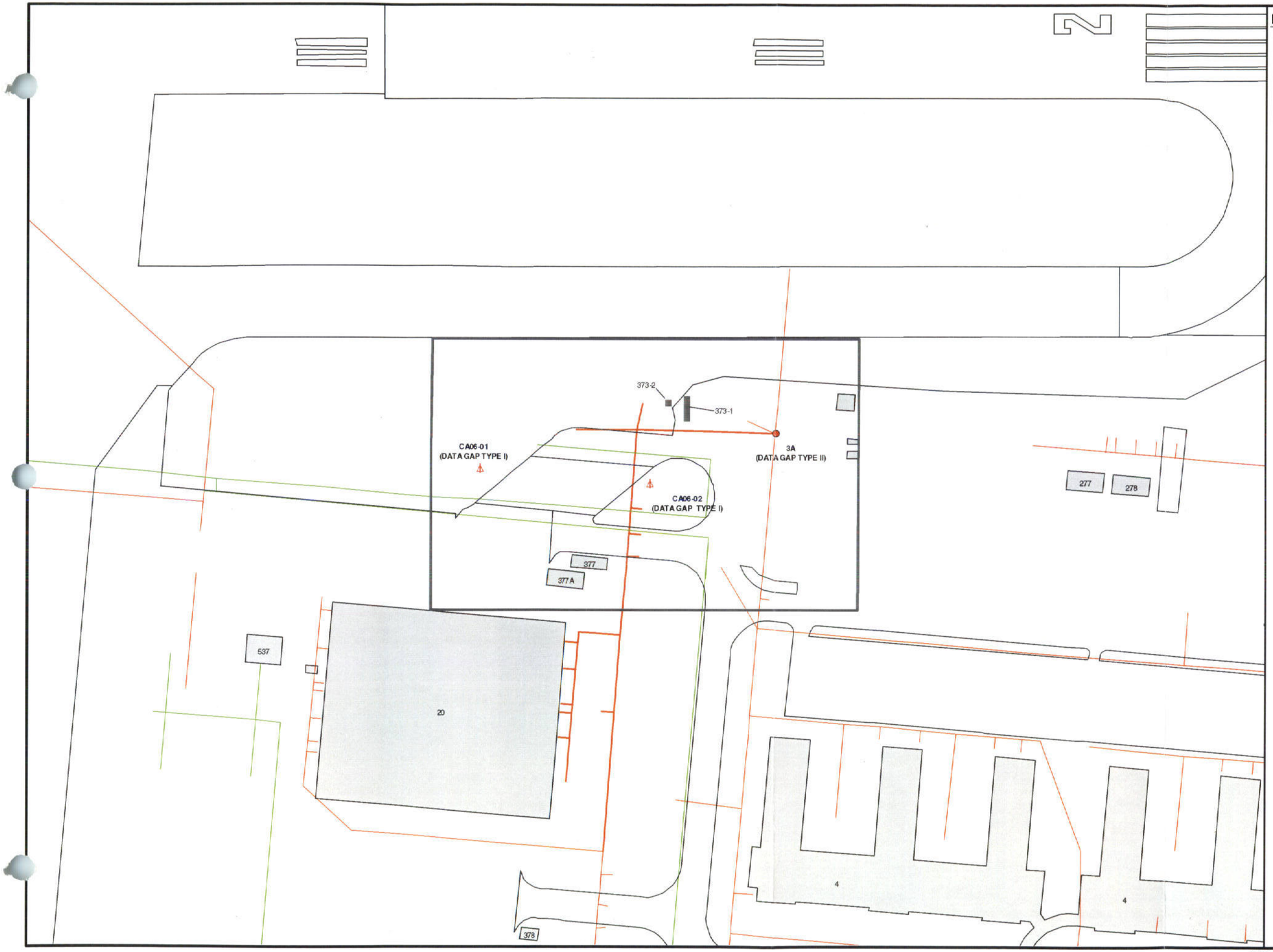
3.6.3 Previous Investigations

In 1995, IT conducted EBS Phase IIa and IIb investigations in Parcel 37, which includes CAA 6 (IT 1998). TTPH levels in groundwater samples collected during the IT investigations indicated that floating product may be present (TTPH >20 mg/L) and that a TPH plume may intersect the storm drains located near the former fuel pump stations.

In 1998, IT removed USTs 373-1 and 373-2 (IT 1999). A 2-inch-diameter puncture was observed on the western side of UST 373-1. The condition of UST 373-2 was not recorded during removal. Floating product was present on the groundwater surface within the excavation and was removed prior to backfilling the excavation. Therefore, floating product near the former USTs is not considered to be a data gap.

3.6.4 Data Gap Investigation Summary

The presence of floating product near the former pump islands was assessed under Data Gap Type I. No floating product was present and TTPH concentrations were less than 20 mg/L. Storm drains located at CAA 6 were investigated under Data Gap Type II. TTPH concentrations were less than 1.4 mg/L and the TPH-associated compound concentrations were less than AWQCs; however, a strong hydrocarbon odor was present in the manhole (MH) sampling location, and water within the MH had a slight sheen prior to pumping. Data gap sampling locations are shown in Figure 3-6. Table 3-17 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 6 are summarized in Tables 3-18 and 3-19 and included in Appendix D.



LEGEND

BOUNDARIES

- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES

- FLOATING PRODUCT PIEZOMETER
- MANHOLE

SITE FEATURES

- BUILDING
- UNDERGROUND STORAGE TANK
- FUEL LINE
- STORM DRAIN LINE
- INVESTIGATED STORM DRAIN LINE

N

50 0 50 100

SCALE: 1"= 100'

FIGURE 3-6
CORRECTIVE ACTION AREA 6
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

Q:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-6 LAYOUT

TABLE 3-17

CORRECTIVE ACTION AREA 6
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• Two soil borings were advanced to 10 feet bgs. • Two piezometers were installed and checked for floating product 24 hours after installation. • Two groundwater samples were collected.	• Soil borings did not have any visible staining; however, a hydrocarbon odor was noted in both borings at depths between 8.0 to 9.0 feet bgs. • Depth to groundwater ranged from 2.41 to 2.68 feet bgs. • No floating product was present. • Groundwater samples had a strong hydrocarbon odor and a slight sheen.
Data Gap Type II: Storm Drain Exposure Pathway	• Two storm drain reaches were investigated. • Two groundwater samples were collected.	• A strong hydrocarbon odor was present in the MH sampling location, and water within the MH, prior to pumping, had a slight sheen. • Groundwater infiltrated both storm drain reaches at a rate of about 10 gallons per minute.

Notes:

bgs Below ground surface
MH Manhole

TABLE 3-18

CORRECTIVE ACTION AREA 6
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA06-01	CA06-02
SAMPLE IDENTIFICATION	030-CAP-080	030-CAP-400
SAMPLE DATE	03-MAY-00	03-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	<0.0005	**0.002**
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
M,P-Xylene	<0.001	<0.001
O-Xylene	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	**0.48**	**1.3**
Motor-oil-range Organics	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	<0.24	**0.41**
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003
Monitored Natural Attenuation Parameters		
Methane	**2.1**	**2.5**
Nitrate	<0.2	<1
Chloride	**1,100**	**5,800**
Sulfate	**1,500**	**570**
Total Alkalinity	**640**	**660**
Bicarbonate Alkalinity	**640**	**660**
Carbonate Alkalinity	<5	<5
Hydroxide Alkalinity	<5	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-19

CORRECTIVE ACTION AREA 6
DATA GAP TYPE II ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	3A	3A
SAMPLE IDENTIFICATION	030-CAP-081	030-CAP-404
SAMPLE DATE	04-MAY-00	04-MAY-00
DEPTH (feet below ground surface)		
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	<0.0005	<0.0005
Toluene	<0.0005	<0.0005
Ethylbenzene	<0.0005	<0.0005
M,P-Xylene	<0.0005	<0.0005
O-Xylene	<0.0005	<0.0005
Methyl Tertiary Butyl Ether	<0.0005	<0.0005
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	<0.05	<0.05
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.7 CORRECTIVE ACTION AREA 7

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 7.

3.7.1 Site Location and Operations Conducted

CAA 7 is located in the Service Station and Naval Exchange Commercial Zones (Zones 20 and 21, respectively) within IR Site 7. CAA 7 includes a former gasoline service station and Buildings 459 and 506. Nine USTs were formerly located within CAA 7: USTs 459-1 through 459-4 each had a capacity of 10,000 gallons and stored gasoline; USTs 459-5 and 459-6 also stored gasoline and had capacities of 10,000 and 8,000 gallons, respectively; USTs 459-7 had a capacity of 2,000 gallons and stored waste oil; UST 459-8 had a capacity of 600 gallons and stored fuel oil; and UST 506-1 had a capacity of 1,400 gallons and stored lubricating oil. Storm drains run primarily in an east-west direction, through the former location of USTs 459-1 through 459-4, and a storm drain runs in an east-west direction, about 30 feet north of former UST 506-1.

3.7.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 7 is designated as part of the Main Street Neighborhood land reuse area. Land reuse may include residential uses, civic and institutional areas, and park areas. Groundwater at CAA 7 is designated as part of the Central Region and is not considered a potential drinking water source.

3.7.3 Previous Investigations

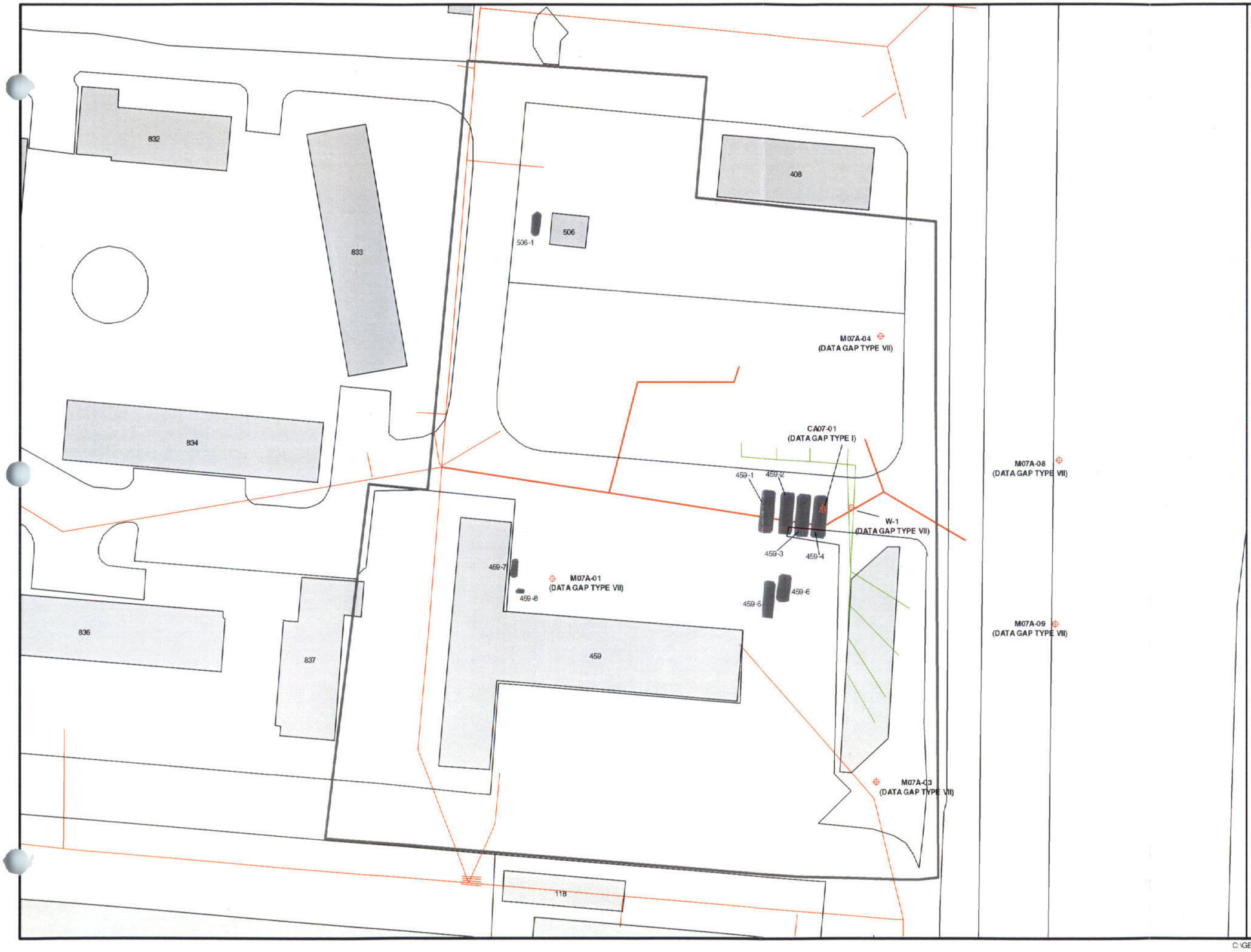
In 1987, ERM leak tested USTs 459-1 through 459-4, following discovery of petroleum contamination in an excavated area adjacent to the fuel station (ERM 1988). UST 459-4 failed leak testing and was taken out of service. AN RI was conducted at CAA 7 between 1991 and 1995 (TtEMI 1999a). USTs 459-5 through 459-8 were removed by PWC in 1995 (PWC 1997d). The sidewalls of the excavation had visible staining, and a sheen was present on the groundwater surface. UST 506-1 was also removed by PWC in 1995 (PWC 1997f). The UST inspection record indicated that the UST was in good condition during removal; no holes were observed (PWC 1997f). TtEMI removed USTs 459-1 through 459-4 and associated fuel lines in 1998 and 1999 (TtEMI 1999h). All four USTs were observed to be in good

condition; however, the sidewalls of the excavation had visible staining, and a sheen was present on the groundwater surface. TTPH levels in groundwater samples collected from a RI monitoring well located east of USTs 459-1 through 459-4 and from the UST excavation indicate that floating product may be present (TTPH >20 mg/L) and a TTPH plume may intersect the storm drain located near the former USTs. In October 1999, TtEMI investigated all monitoring wells at CAA 7 for floating product (TtEMI 2000b). Floating product was not found in any of the monitoring wells.

Samples collected during CAA 7 previous investigations were not analyzed for MTBE.

3.7.4 Data Gap Investigation Summary

The presence of floating product near former USTs 459-1 through 459-4 was assessed under Data Gap Type I. No floating product was present and the TTPH concentration was less than 20 mg/L. The storm drain that runs in an east-west direction through the location of the former USTs was investigated under Data Gap Type II. The storm drain reach was grouted with concrete; therefore, a groundwater sample was not collected. The presence of MTBE in groundwater was assessed under Data Gap Type VII. MTBE exceeded the MCL at sampling locations W-1 and CA07-01 (investigated under Data Gap Type I); however, groundwater at CAA 7 is not considered a potential drinking water source. Additionally, MTBE did not exceed the MCL at downgradient sampling locations M07A-08 and M07A-09. Data gap sampling locations are shown in Figure 3-7. Table 3-20 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 7 are summarized in Tables 3-21 and 3-22 and included in Appendix D.



LEGEND

BOUNDARIES

- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES

- FLOATING PRODUCT PIEZOMETER
- MONITORING WELL

SITE FEATURES

- BUILDING
- UNDERGROUND STORAGE TANK
- FUEL LINE
- STORM DRAIN LINE
- INVESTIGATED STORM DRAIN LINE

N

30 0 30 60

SCALE: 1"= 60'

FIGURE 3-7
CORRECTIVE ACTION AREA 7
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

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TABLE 3-20

CORRECTIVE ACTION AREA 7
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• One soil boring was advanced to 10 feet bgs. • One piezometer was installed and checked for floating product 24 hours after installation. • One groundwater sample was collected.	• The soil boring did not have any visible staining; however, a hydrocarbon odor was noted at a depth of 8.0 feet bgs. • Depth to groundwater was 1.80 feet bgs. • No floating product was present. • The groundwater sample did not have an odor or sheen.
Data Gap Type II: Storm Drain Exposure Pathway	• The storm drain reach that runs in an east-west direction through the former location of underground storage tanks 459-1 through 459-4 was investigated.	• The storm drain reach was grouted with concrete; therefore a groundwater sample was not collected.
Data Gap Type VII: Methyl Tertiary-butyl Ether Migration	• Seven groundwater samples were collected from existing monitoring wells.	• Depth to groundwater ranged from 1.22 to 3.20 feet bgs. • Groundwater samples collected from monitoring wells (MW) M07A-01, M07A-04, M07A-09, and W-1 had a hydrocarbon odor, but no sheen. • The groundwater sample collected from MW M07A-08 has a sulfur odor, but no sheen. • The groundwater sample collected from MW M07A-03 did not have an odor or sheen.

Notes:

bgs Below ground surface
MW Monitoring well

TABLE 3-21

CORRECTIVE ACTION AREA 7
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA07-01
SAMPLE IDENTIFICATION	030-CAP-082
SAMPLE DATE	25-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	<0.05
Toluene	<0.1
Ethylbenzene	<0.1
M,P-Xylene	<0.1
O-Xylene	<0.1
Methyl Tertiary Butyl Ether	**12**
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	<0.1
Motor-oil-range Organics	<0.5
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	<0.16
Inorganic Compounds (Dissolved)	
Lead	<0.003
Monitored Natural Attenuation Parameters	
Methane	**1.7**
Nitrate	<0.1
Chloride	**830**
Sulfate	**340**
Total Alkalinity	**460**
Bicarbonate Alkalinity	**460**
Carbonate Alkalinity	<5
Hydroxide Alkalinity	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-22

CORRECTIVE ACTION AREA 7
DATA GAP TYPE VII ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	M07A-01	M07A-03	M07A-03
SAMPLE IDENTIFICATION	030-CAP-084	030-CAP-362	030-CAP-089
SAMPLE DATE	28-APR-00	28-APR-00	28-APR-00
DEPTH (feet below ground surface)			
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002

TABLE 3-22

CORRECTIVE ACTION AREA 7
DATA GAP TYPE VII ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	M07A-04	M07A-08	M07A-09
SAMPLE IDENTIFICATION	030-CAP-086	030-CAP-087	030-CAP-088
SAMPLE DATE	28-APR-00	28-APR-00	28-APR-00
DEPTH (feet below ground surface)			
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Methyl Tertiary Butyl Ether	<0.002	**0.0052**	<0.002

TABLE 3-22

CORRECTIVE ACTION AREA 7
DATA GAP TYPE VII ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 3 of 3)

POINT NAME	W-1
SAMPLE IDENTIFICATION	030-CAP-085
SAMPLE DATE	28-APR-00
DEPTH (feet below ground surface)	
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Methyl Tertiary Butyl Ether	**0.75**

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.8. CORRECTIVE ACTION AREA 9

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 9.

3.8.1 Site Location and Operations Conducted

CAA 9 is located in the Dock Support Services and the Southeastern Recreational Zones (Zones 19 and 23, respectively) and includes Buildings 584 and 608. CAA 9 contained USTs 584-1 and 584-2 and 608-1. USTs 584-1 and 584-2 each had a capacity of 4,000 gallons and stored diesel fuel for a boiler in Building 584. Building 608 was used as an auto service and repair facility. Two OWSs were present near Building 608 and received drainage from the western and eastern portions of the building. UST 608-1 had a capacity of 600 gallons and stored waste oil. Storm drains are located west of Building 584 and north of Building 608.

3.8.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 9 is designated as part of the Inner Harbor and Marina District land reuse areas. Land reuse may include offices, research and development areas, commercial and residential uses, civic/institutional areas, mixed-use (which may include residential uses), and park areas. Groundwater at CAA 9 is designated as part of the Southeastern Region and is considered a potential drinking water source.

3.8.3 Previous Investigations

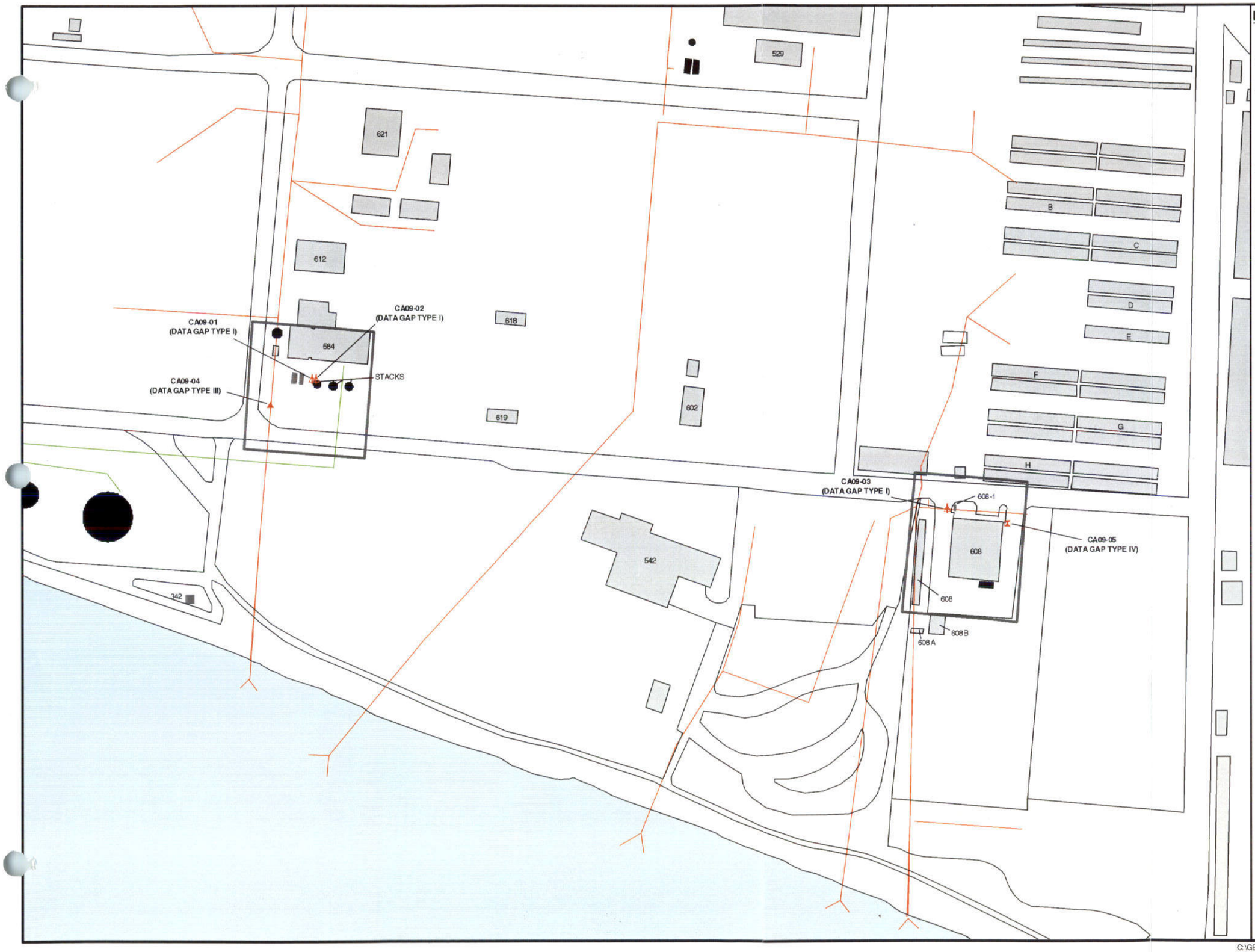
PWC removed USTs 584-1 and 584-2 and associated piping in 1994 (PWC 1996g). Floating product was visible in the excavation of UST 584-2. In 1995, ERM conducted Phase I and Phase II investigations near former USTs 584-1 and 584-2 (ERM 1996). TTPH levels in groundwater samples collected during the ERM investigation indicate that floating product may be present (TTPH >20 mg/L) and a TPH plume may intersect the storm drain located west of Building 584. In October 1999, TtEMI investigated three monitoring wells near former USTs 584-1 and 584-2 for floating product (TtEMI 2000b). Floating product was not found in any of the monitoring wells.

PWC removed UST 608-1 and associated piping in 1995 (PWC 1997h). The UST was found filled with slurry and had to be removed in pieces. The excavation showed no signs of visible staining. In 1997, Moju conducted a soil and groundwater investigation near the former UST (Moju 1998b). Between 1997 and 1999, Moju collected quarterly groundwater monitoring well samples (Moju 1998a, 1998c, 1999a, 1999b). TTPH levels in groundwater samples collected during the Moju investigations indicated that floating product may be present near the former UST (TTPH >20 mg/L).

During previous investigations conducted at CAA 9, samples were not collected near the OWS located on the eastern side of Building 608.

3.8.4 Data Gap Investigation Summary

The presence of floating product near former USTs 584-1 and 584-2 and 608-1 was assessed under Data Gap Type I. No floating product was present and TTPH concentrations were less than 20 mg/L. Current TTPH and TPH-associated compound concentrations in groundwater near the storm drain located west of Building 584 was assessed under Data Gap Type III. The TTPH concentration was less than 1.4 mg/L and the TPH-associated compound concentrations were less than AWQCs. The OWS located east of Building 608 was investigated under Data Gap Type IV. The TTPH and TPH-associated compound concentrations in soil did not exceed interim residential PRCs. The TTPH and TPH-associated compound concentrations in groundwater did not exceed 20mg/L or MCLs, respectively. Data gap sampling locations are shown in Figure 3-8. Table 3-23 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 9 are summarized in Tables 3-24 through 3-26 and included in Appendix D.



LEGEND

BOUNDARIES

- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES

- FLOATING PRODUCT PIEZOMETER
- DIRECT-PUSH - GROUNDWATER
- DIRECT-PUSH - SOIL/GROUNDWATER

SITE FEATURES

- BUILDING
- ABOVEGROUND STORAGE TANK
- UNDERGROUND STORAGE TANK
- FUEL LINE
- STORM DRAIN LINE

N

75 0 75 150

SCALE: 1"= 150'

FIGURE 3-8
CORRECTIVE ACTION AREA 9
DATA GAP SAMPLING LOCATIONS

ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-8 LAYOUT

TABLE 3-23

CORRECTIVE ACTION AREA 9
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• Three soil borings were advanced to 10 feet bgs. • Three piezometers were installed and checked for floating product 24 hours after installation. • Three groundwater samples were collected.	• Soil borings did not have any visible staining; however, a hydrocarbon odor was noted in the boring collected near former UST 584-1 at a depth of 8.0 feet bgs. • Depth to groundwater ranged from 4.53 to 6.48 feet bgs. • No floating product was present. • Groundwater samples collected near former USTs 584-1 and 584-2 had a hydrocarbon odor and a slight sheen. The groundwater sample collected near former UST 608-1 had a solvent odor, but no sheen.
Data Gap Type III: Current Groundwater Total Total Petroleum Hydrocarbons Concentrations Near Storm Drains	• One soil boring was advanced to 8 feet bgs. • One groundwater sample was collected.	• The soil boring did not have any visible staining or odors. • Depth to groundwater was 6.0 feet bgs. • The groundwater sample did not have an odor or sheen.
Data Gap Type IV: OWSs	• The OWSs located on the eastern side of Building 608 was investigated for visible signs of contamination. • One soil boring was advanced to 8 feet bgs. • Two soil samples were collected at depths of 3.5 to 4.0 feet bgs and 5.0 to 6.0 feet bgs. • One groundwater sample was collected.	• No signs of visible contamination were present near the OWS. • The soil boring did not have any visible staining or odors. • Depth to groundwater was 4.5 feet bgs. • The groundwater sample did not have an odor or sheen.

Notes:

bgs Below ground surface
OWS Oil water separator

TABLE 3-24

CORRECTIVE ACTION AREA 9
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA09-01	CA09-02	CA09-03
SAMPLE IDENTIFICATION	030-CAP-090	030-CAP-091	030-CAP-092
SAMPLE DATE	25-APR-00	25-APR-00	26-APR-00
DEPTH (feet below ground surface)	0.0 to 8.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	**0.0005**	<0.0005	<0.0005
Toluene	<0.001	<0.001	**0.0007**
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	**0.0005**	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.059	<0.05	<0.05
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	**0.021**	**0.0041**	**0.025**
Nitrate	**0.53**	**1.6**	<0.1
Chloride	**13**	**23**	**4.9**
Sulfate	**120**	**43**	**18**
Total Alkalinity	**180**	**350**	**100**
Bicarbonate Alkalinity	**180**	**330**	**100**
Carbonate Alkalinity	<5	**15**	<5
Hydroxide Alkalinity	<5	<5	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-25

CORRECTIVE ACTION AREA 9
DATA GAP TYPE III ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	CA09-04
SAMPLE IDENTIFICATION	030-CAP-094
SAMPLE DATE	24-APR-00
DEPTH (feet below ground surface)	6.0 to 8.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	<0.0005
Toluene	<0.001
Ethylbenzene	<0.001
Xylene (Total)	<0.001
Methyl Tertiary Butyl Ether	<0.002
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	<0.1
Motor-oil-range Organics	<0.5
JP5-Range Organics	<0.1
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	<0.05
Inorganic Compounds (Dissolved)	
Lead	<0.003

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-26

CORRECTIVE ACTION AREA 9
DATA GAP TYPE IV ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA09-05	CA09-05	CA09-05
SAMPLE IDENTIFICATION	030-CAP-095	030-CAP-096	030-CAP-097
SAMPLE DATE	24-APR-00	24-APR-00	24-APR-00
DEPTH (feet below ground surface)	3.5 to 4.0	5.0 to 6.0	3.0 to 8.0
MEDIA (Units)	Soil (mg/kg)	Soil (mg/kg)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.01	<0.01	<0.0005
Toluene	<0.01	<0.01	<0.001
Ethylbenzene	<0.01	<0.01	<0.001
Xylene (Total)	<0.01	<0.01	<0.001
Methyl Tertiary Butyl Ether	<0.01	<0.01	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<10	<10	<0.1
Motor-oil-range Organics	<250	<250	<0.5
JP5-Range Organics	<10	<10	<0.1
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	<0.5	<0.05
Inorganic Compounds (Dissolved)			
Lead	NA	NA	<0.003
Inorganic Compounds (Total)			
Lead	**13**	**20**	NA

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.9 CORRECTIVE ACTION AREA 10

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 10.

3.9.1 Site Location and Operations Conducted

CAA 10 is located in the Western Hangar Zone (Zone 6) and includes Building 491 and a portion of Building 19. CAA 10 contained UST 491-1. UST 491-1 had a capacity of 1,000 gallons and stored gasoline for a backup generator located within Building 491. No storm drains are located within CAA 10.

3.9.2 Proposed Land Reuse and Groundwater Beneficial Use

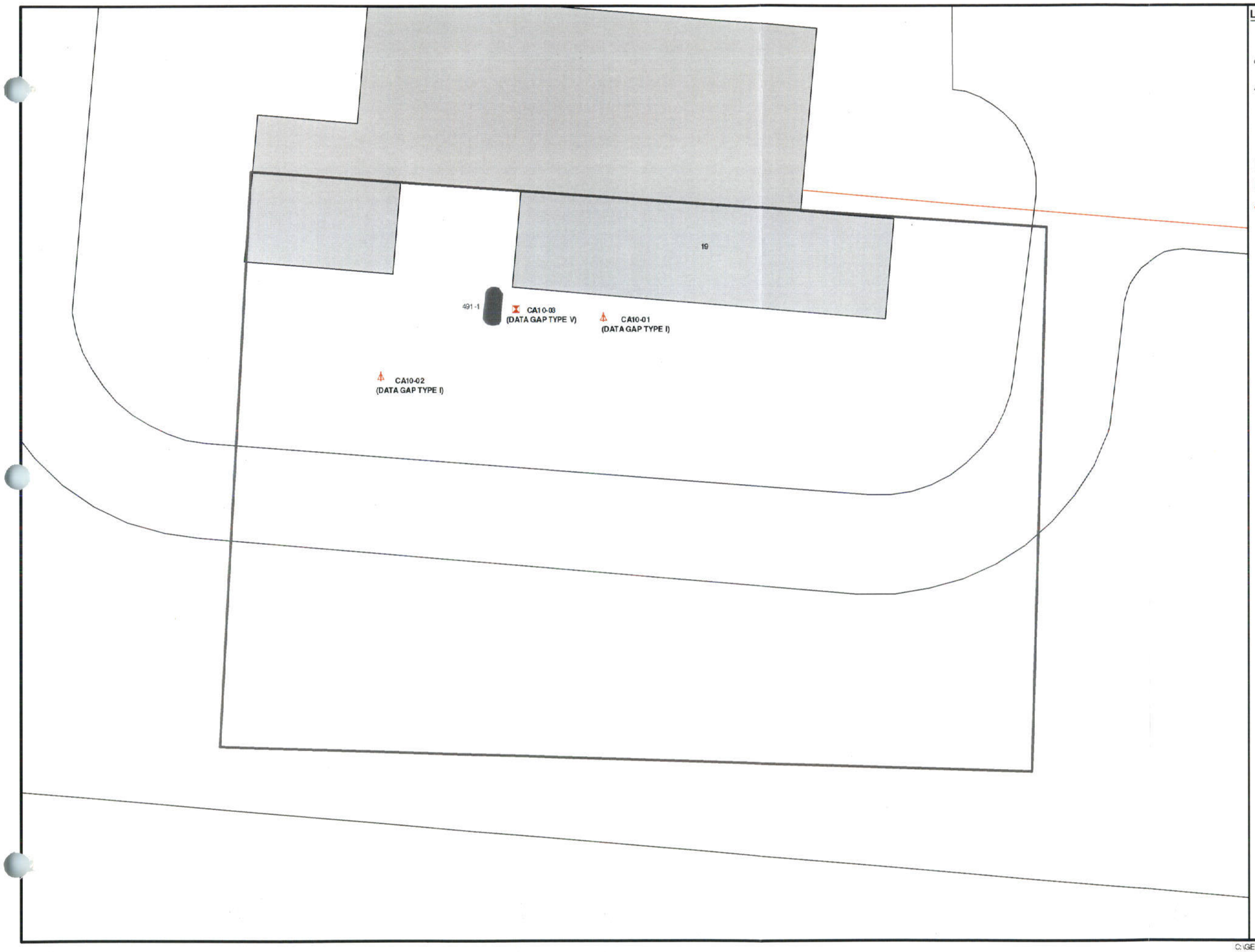
CAA 10 is designated as part of the Civic Core land reuse area. Land reuse may include a research and development area, an industrial workplace area, an open space/civic mall area, and mixed-use (which may include residential uses). Groundwater at CAA 10 is designated as part of the Central Region and is not considered a potential drinking water source.

3.9.3 Previous Investigations

PWC removed UST 491-1 in August 1994 (PWC 1997e). During removal, several holes were observed and elevated TPH and TPH-associated compound concentrations were detected in the soil excavation sample. TTPH levels in the soil sample indicated that a source area may extend beneath the southern side of Building 19. A soil and groundwater investigation was conducted by ERM in the vicinity of UST 491-1 in 1995 (ERM 1996). TTPH levels in groundwater samples collected southwest and east of the former UST indicated that floating product may be present (TTPH >20 mg/L). Moju conducted a soil and groundwater investigation in 1997 (Moju 1998b). In November 1999, TtEMI investigated three monitoring wells near former UST 491-1 for floating product (TtEMI 2000b). Floating product was not found in any of the monitoring wells.

3.9.4 Data Gap Investigation Summary

The presence of floating product southwest and east of former UST 491-1 was assessed under Data Gap Type I. No floating product was present; however, the TTPH concentration exceeded 20 mg/L at sampling location CA10-01. The soil source area near the southern side of Building 19 was investigated under Data Gap Type V. Xylenes (total) and TTPH exceeded the interim residential PRCs for soil at sampling location CA10-03. Xylenes (total) and TPH gasoline-range also exceed the revised residential PRCs (see Section 1.1.2) at sampling location CA10-03; however, TTPH does not exceed revised residential PRCs. Data gap sampling locations are shown in Figure 3-9. Table 3-27 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 10 are summarized in Tables 3-28 and 3-29 and included in Appendix D.



LEGEND

BOUNDARIES

- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES

- FLOATING PRODUCT PIEZOMETER
- DIRECT-PUSH - SOIL/GROUNDWATER

SITE FEATURES

- BUILDING
- UNDERGROUND STORAGE TANK
- STORM DRAIN LINE

N

10 0 10 20

SCALE: 1"= 20'

FIGURE 3-9
CORRECTIVE ACTION AREA 10
DATA GAP SAMPLING LOCATIONS

ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-9 LAYOUT

TABLE 3-27

CORRECTIVE ACTION AREA 10
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• Two soil borings were advanced to 10 feet bgs. • Two piezometers were installed and checked for floating product 24 hours after installation. • Two groundwater samples were collected.	• Soil borings did not have any visible staining or odors. • Depth to groundwater ranged from 4.64 to 5.52 feet bgs. • No floating product was present. • The groundwater sample collected east of former UST 491-1 had a strong hydrocarbon odor, but no sheen. The groundwater sample collected southwest of former UST 491-1 did not have an odor or sheen.
Data Gap Type V: Soil Source Areas	• One soil borings was advanced near former UST 491-1, directly south of Building 19, to 8 feet bgs. • Four soil samples were collected. • Two groundwater samples were collected.	• The soil boring did not have any visible staining or odors. • Depth to groundwater was about 5.3 feet bgs.

Notes:

bgs Below ground surface
UST Underground storage tank

TABLE 3-28

CORRECTIVE ACTION AREA 10
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

POINT NAME	CA10-01	CA10-02
SAMPLE IDENTIFICATION	030-CAP-098	030-CAP-099
SAMPLE DATE	28-APR-00	28-APR-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	**0.023**	<0.0005
Toluene	**0.19**	<0.001
Ethylbenzene	**1.1**	<0.001
M,P-Xylene	**1.2**	<0.001
O-Xylene	**0.19**	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	**2.4**	<0.1
Motor-oil-range Organics	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	**19**	<0.05
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003
Monitored Natural Attenuation Parameters		
Methane	**0.86**	**0.0035**
Nitrate	<0.1	**0.31**
Chloride	**5.4**	**10**
Sulfate	**16**	**15**
Total Alkalinity	**160**	**170**
Bicarbonate Alkalinity	**160**	**170**
Carbonate Alkalinity	<5	<5
Hydroxide Alkalinity	<5	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-29

CORRECTIVE ACTION AREA 10
DATA GAP TYPE V ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA10-03	CA10-03	CA10-03
SAMPLE IDENTIFICATION	030-CAP-100	030-CAP-363A	030-CAP-101
SAMPLE DATE	27-APR-00	27-APR-00	27-APR-00
DEPTH (feet below ground surface)	3.0 to 4.0	5.9 to 6.3	6.3 to 7.5
MEDIA (Units)	Soil (mg/kg)	Soil (mg/kg)	Soil (mg/kg)
Volatile Organic Compounds			
Benzene	<0.01	NA	<20
Toluene	<0.01	NA	**62**
Ethylbenzene	<0.01	NA	**69**
Xylene (Total)	<0.01	NA	**520**
Methyl Tertiary Butyl Ether	<0.01	NA	<20
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<10	NA	**69**
Motor-oil-range Organics	<250	NA	<250
JP5-Range Organics	<10	NA	**51**
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	NA	**3,500**
Inorganic Compounds (Dissolved)			
Lead	NA	NA	NA
Inorganic Compounds (Total)			
Lead	<11	<12	<12

TABLE 3-29

CORRECTIVE ACTION AREA 10
DATA GAP TYPE V ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA10-03	CA10-03	CA10-03
SAMPLE IDENTIFICATION	030-CAP-363	030-CAP-118	030-CAP-365
SAMPLE DATE	27-APR-00	27-APR-00	27-APR-00
DEPTH (feet below ground surface)	7.5 to 8.0	3.0 to 8.0	3.0 to 8.0
MEDIA (Units)	Soil (mg/kg)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.01	<0.01	<0.01
Toluene	<0.01	**1.6**	**1.1**
Ethylbenzene	<0.01	**0.43**	**0.31**
Xylene (Total)	<0.01	**2.2**	**1.4**
Methyl Tertiary Butyl Ether	<0.01	<0.02	<0.02
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	**44**	<0.1	<0.1
Motor-oil-range Organics	<250	<0.5	<0.5
JP5-Range Organics	**27**	<0.1	<0.1
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	**12**	**11**
Inorganic Compounds (Dissolved)			
Lead	NA	<0.003	<0.003
Inorganic Compounds (Total)			
Lead	NA	NA	NA

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.10 CORRECTIVE ACTION AREA 11

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 11.

3.10.1 Site Location and Operations Conducted

CAA 11 is located in the Engine Testing and Hazardous Materials Zone (Zone 17) and includes a portion of IR Site 11 (Building 14-the aircraft engine test and repair facility), a former fuel storage area (Area 37), and a secondary containment area (Structure 598). CAA 11 contained USTs 14-1 through 14-6 and 37-1 through 37-24. USTs 14-1 through 14-3 each had a capacity of 10,000 gallons and stored lubricating oil. UST 14-4 had a capacity of 1,000 gallons and stored waste oil, UST 14-5 had a capacity of 4,500 gallons and stored gasoline, UST 14-6 had a capacity of 600 gallons and stored diesel. USTs 37-1 through 37-12 and 37-17 through 37-24 were located within Area 37 and were used for the storage of diesel, gasoline, jet fuel, and other miscellaneous liquids and each had capacities ranging from 1,500 to 28,000 gallons. USTs 37-13 through 37-16 were located south of Area 37, each had a capacity of 25,000 gallons and were used as a central fueling storage point for aircraft aboard ships berthed at Piers 1, 2, and 3. USTs 37-1, 37-3, 37-4, and 37-13 through 37-16 are RCRA permitted USTs. Structure 598 contained three 25,000-gallon aboveground storage tanks (AST) used to store aircraft fuel. Five OWSs were also present near Building 14. Storm drains are present within CAA 11.

3.10.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 11 is designated as part of the Inner Harbor and Marina District land reuse areas. Land reuse may include offices, research and development areas, commercial and residential uses, civic/institutional areas, mixed-use (which may include residential uses), and park areas. Groundwater at CAA 11 is designated as part of the Southeastern Region and is considered a potential drinking water source.

3.10.3 Previous Investigations

PWC removed USTs 14-1 through 14-3 and 14-6 in 1994 (PWC 1996a). Visible soil contamination was present on the northern sidewall of the excavation, and a foamy layer (although no sheen) was present on the groundwater. PWC removed USTs 14-4 and 14-5 and the associated vent lines in 1994 (PWC 1996a).

No holes were observed in UST 14-4; however, a tar-like substance was noted to be dripping from the tank. A hole was observed on the western side of UST 14-5, and visible contamination was observed in the southern and eastern sidewalls of the excavation. Black, free product was also observed on the groundwater in the excavation of UST 14-5. TTPH levels in groundwater samples collected during the removal of USTs 14-1 through 14-6 indicated that floating product may be present (TTPH >20 mg/L).

USTs 37-9 through 37-12 and 37-21 through 37-24 were removed in 1995 and appeared to be in good condition, although a small amount of black oil was observed floating on the groundwater in the excavation of UST 37-24 (PWC 1996c). In 1997, Moju conducted an investigation to assess the lateral and vertical extent of petroleum compounds in soil and groundwater at CAA 11 (Moju 1998b). Based on the initial results, Moju conducted step-out soil and groundwater sampling in 1997. TtEMI removed USTs 37-1 through 37-8 and 37-13 through 37-20 in 1998 (TtEMI 1999e, 1999f). The USTs appeared to be in good condition; however significant soil staining and hydrocarbon odors were observed in the excavations. TTPH levels in groundwater samples collected from the UST excavations and during the Moju investigation indicate that floating product may be present near the former USTs (TTPH >20 mg/L) and a TPH plume may intersect the storm drain located in the southern portion of CAA 11. In October 1999, TtEMI investigated 10 monitoring wells at CAA 11 for floating product (TtEMI 2000b). Floating product was not found in any of the monitoring wells.

During previous investigations conducted at CAA 11, samples were not collected near the five OWSs located near Building 14.

The fuel lines located east of Seaplane Lagoon were removed by IT in 1998 (TtEMI 2000a). Elevated concentrations of TTPH and TPH-associated compounds were present in confirmation groundwater samples collected near the southern fuel lines. Groundwater samples were not collected near the northern fuel line.

3.10.4 Data Gap Investigation Summary

The presence of floating product near former UST locations was assessed under a Data Gap Type I. No floating product was present and TTPH concentrations were less than 20 mg/L. Storm drains located south of former USTs 37-13 through 37-16 were investigated under Data Gap Type II. Groundwater samples were not collected because there was no flow from the outfall. Additionally, the water within the catch basins did not have a hydrocarbon odor or sheen. The five OWSs located near Building 14 were

investigated under Data Gap Type IV. TTPH and TPH-associated compound concentrations did not exceed interim residential PRCs in soil. However, TTPH exceeded 20 mg/L in groundwater at sampling location CA11-16. TTPH and TPH-associated compound concentrations did not exceed 20 mg/L or MCLs, respectively, at any other Data Gap Type IV sampling locations. TTPH and TPH-associated compound concentrations in groundwater near the northern portion of the former fuel line located east of the Seaplane Lagoon were assessed under Data Gap Type IX. The TTPH concentrations exceeded 20 mg/L in groundwater at sampling locations CA11-22 and CA11-24. TTPH and TPH-associated compound concentrations did not exceed 20 mg/L or MCLs, respectively, at any other Data Gap Type IX sampling locations. Data gap sampling locations are shown in Figure 3-10. Table 3-30 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 11 are summarized in Tables 3-31 through 3-33 and included in Appendix D.

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 3-10 – CORRECTIVE ACTION AREA 11
DATA GAP SAMPLING LOCATIONS

FOR ADDITIONAL INFORMATION, CONTACT:

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SENSITIVE

SEAPLANE LAGOON

OUTFALL G
OUTFALL H
OUTFALL I
OUTFALL J

CA11-20 (DATA GAP TYPE IX)
CA11-21 (DATA GAP TYPE IX)
CA11-22 (DATA GAP TYPE IX)
CA11-23 (DATA GAP TYPE IX)
CA11-24 (DATA GAP TYPE IX)
CA11-25 (DATA GAP TYPE IX)
CA11-14 (DATA GAP TYPE IV)
CA11-15 (DATA GAP TYPE IV)
CA11-16 (DATA GAP TYPE IV)
CA11-17 (DATA GAP TYPE IV)
CA11-13 (DATA GAP TYPE I)
CA11-12 (DATA GAP TYPE I)
CA11-11 (DATA GAP TYPE I)
CA11-09 (DATA GAP TYPE I)
CA11-10 (DATA GAP TYPE I)
CA11-01 (DATA GAP TYPE I)
CA11-02 (DATA GAP TYPE I)
CA11-03 (DATA GAP TYPE I)
CA11-05 (DATA GAP TYPE I)
CA11-04 (DATA GAP TYPE I)
CA11-06 (DATA GAP TYPE I)
CA11-07 (DATA GAP TYPE I)
CA11-08 (DATA GAP TYPE I)

113
162
349
14
265
414
163
372
170
616
168
397
169
64
15
68
38
449
598

LEGEND

BOUNDARIES
- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES
- DIRECT-PUSH - GROUNDWATER
- DIRECT-PUSH - SOIL/GROUNDWATER
- FLOATING PRODUCT PIEZOMETER

SITE FEATURES
- BUILDING
- ABOVEGROUND STORAGE TANK
- UNDERGROUND STORAGE TANK
- FUEL LINE
- STORM DRAIN LINE
- INVESTIGATED STORM DRAIN

N

75 0 75 150

SCALE: 1"= 150'

FIGURE 3-10
CORRECTIVE ACTION AREA 11
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-10 LAYOUT

SENSITIVE

TABLE 3-30

CORRECTIVE ACTION AREA 11
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 2)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type I: Floating Product	• Thirteen soil borings were advanced to 10 feet bgs. • Thirteen piezometers were installed and checked for floating product 24 hours after installation. • Fourteen groundwater samples were collected.	• The soil borings did not have any visible staining; however, a hydrocarbon odor was noted in two borings collected near former USTs 37-9 and 37-10 at depths of 4.5 and 5.0 feet bgs. • Depth to groundwater ranged from 3.75 to 6.75 feet bgs. • No floating product was present. • Groundwater samples collected near former USTs 14-3, 14-4, and 37-9 had a hydrocarbon odor and a sheen. Groundwater samples collected near former USTs 37-10 and 37-17 had a hydrocarbon odor, but no sheen.
Data Gap Type II: Storm Drain Exposure Pathway	• Storm drains located south of former USTs 37-13 through 37-16 and the associated outfall (Outfall J) were investigated. • No samples were collected.	• There was no flow from the outfall; therefore, no outfall sample was collected. • The outfall has a seawater infiltration prevention door. • Several catch basins located south of former USTs 37-13 through 37-16 had stagnant water and sediment. • The water within the catch basins did not have a hydrocarbon odor or sheen.

TABLE 3-30

CORRECTIVE ACTION AREA 11
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 2)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type IV: OWSs	• Four OWSs located near Building 14 were inspected for visual sign of contamination. • Three soil borings were advanced to 8 feet bgs, and one boring was advanced to 10 feet bgs. • Nine soil samples were collected at depths ranging from 2 to 8 feet bgs. • Five groundwater samples were collected. • A piezometer was installed at Sampling Location CA11-16 and checked for floating product 24 hours after installation. • One of the three OWSs shown south of Building 14 in Naval Air Station Alameda design drawings could not be located.	• The soil borings did not have any visible staining; however, a hydrocarbon odor was noted at a depth of 7.2 feet bgs in the soil boring collected at Sampling Location CA11-16. • Depth to groundwater ranged from 5 to 6 feet bgs. • The groundwater sample collected at Sampling Location CA11-16 had a strong hydrocarbon odor and sheen. • No floating product was present.
Data Gap Type IX: Soil and Groundwater Contamination from Fuel Lines	• Six soil borings were advanced to a depth of 8 feet bgs, near the northern portion of the former fuel line located east of Seaplane Lagoon. • Six groundwater samples were collected.	• Soil borings did not have any visible staining or odors. • Groundwater samples had a sulfur odor but no sheen. • Depth to groundwater was 5.5 feet bgs.

Notes:

bgs Below ground surface
OWS Oil water separator
UST Underground storage tank

TABLE 3-31

CORRECTIVE ACTION AREA 11
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-01	CA11-02	CA11-03
SAMPLE IDENTIFICATION	030-CAP-127	030-CAP-128	030-CAP-129
SAMPLE DATE	02-MAY-00	02-MAY-00	02-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	**0.0066**
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	**2.7**
Motor-oil-range Organics	<0.5	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.05	<0.05	**2.6**
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	**1.5**	<0.0005	**2.6**
Nitrate	<0.1	**0.71**	<0.1
Chloride	**9.6**	**8.8**	**130**
Sulfate	**68**	**88**	**83**
Total Alkalinity	**310**	**190**	**530**
Bicarbonate Alkalinity	**310**	**190**	**530**
Carbonate Alkalinity	<5	<5	<5
Hydroxide Alkalinity	<5	<5	<5

TABLE 3-31

CORRECTIVE ACTION AREA 11
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 2 of 5)

POINT NAME	CA11-04	CA11-05	CA11-06
SAMPLE IDENTIFICATION	030-CAP-130	030-CAP-131	030-CAP-132
SAMPLE DATE	02-MAY-00	02-MAY-00	08-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.05	<0.05	<0.12
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	<0.0005	**0.035**	**0.0065**
Nitrate	**0.65**	**0.17**	<0.1
Chloride	**130**	**15**	**18**
Sulfate	**83**	**130**	**23**
Total Alkalinity	**250**	**260**	**300**
Bicarbonate Alkalinity	**250**	**260**	**300**
Carbonate Alkalinity	<5	<5	<5
Hydroxide Alkalinity	<5	<5	<5

TABLE 3-31

CORRECTIVE ACTION AREA 11
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-07	CA11-08	CA11-09
SAMPLE IDENTIFICATION	030-CAP-133	030-CAP-134	030-CAP-138
SAMPLE DATE	08-MAY-00	09-MAY-00	02-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.14	<0.05	<0.05
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	**0.7**	**0.21**	**4.9**
Nitrate	<0.1	**0.88**	<0.1
Chloride	**25**	**30**	**11**
Sulfate	**35**	**34**	**21**
Total Alkalinity	**250**	**290**	**350**
Bicarbonate Alkalinity	**250**	**290**	**350**
Carbonate Alkalinity	<5	<5	**7.7**
Hydroxide Alkalinity	<5	<5	<5

TABLE 3-31

CORRECTIVE ACTION AREA 11
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-09	CA11-10	CA11-11
SAMPLE IDENTIFICATION	030-CAP-366	030-CAP-136	030-CAP-137
SAMPLE DATE	02-MAY-00	02-MAY-00	03-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
M,P-Xylene	<0.001	<0.001	<0.001
O-Xylene	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5	<0.5
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.05	<0.05	<0.05
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Monitored Natural Attenuation Parameters			
Methane	**5**	**0.026**	**0.66**
Nitrate	<0.1	<0.1	<0.1
Chloride	**11**	**76**	**16**
Sulfate	**21**	**430**	**78**
Total Alkalinity	**350**	**560**	**250**
Bicarbonate Alkalinity	**350**	**560**	**250**
Carbonate Alkalinity	<5	<5	<5
Hydroxide Alkalinity	<5	<5	<5

TABLE 3-31

CORRECTIVE ACTION AREA 11
DATA GAP TYPE I ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-12	CA11-13
SAMPLE IDENTIFICATION	030-CAP-135	030-CAP-139
SAMPLE DATE	03-MAY-00	03-MAY-00
DEPTH (feet below ground surface)	0.0 to 10.0	0.0 to 10.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	<0.0005	<0.0005
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
M,P-Xylene	<0.001	<0.001
O-Xylene	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	**1.7**	<0.1
Motor-oil-range Organics	**1.3**	<0.5
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	<0.05	<0.05
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003
Monitored Natural Attenuation Parameters		
Methane	**2.8**	**0.72**
Nitrate	<0.1	**1.8**
Chloride	**29**	**360**
Sulfate	**11**	**61**
Total Alkalinity	**250**	**310**
Bicarbonate Alkalinity	**250**	**310**
Carbonate Alkalinity	<5	<5
Hydroxide Alkalinity	<5	<5

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-32

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IV ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-14	CA11-14	CA11-15
SAMPLE IDENTIFICATION	030-CAP-141	030-CAP-142	030-CAP-143
SAMPLE DATE	28-APR-00	28-APR-00	28-APR-00
DEPTH (feet below ground surface)	3.0 to 4.0	6.0 to 7.0	3.0 to 4.0
MEDIA (Units)	Soil (mg/kg)	Soil (mg/kg)	Soil (mg/kg)
Volatile Organic Compounds			
Benzene	<0.01	<0.01	<0.01
Toluene	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01
Xylene (Total)	<0.01	<0.01	<0.01
Methyl Tertiary Butyl Ether	<0.01	<0.01	<0.01
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<10	15	<10
Motor-oil-range Organics	<250	<250	<250
JP5-Range Organics	<10	<10	<10
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	<0.5	<0.5
Inorganic Compounds (Dissolved)			
Lead	NA	NA	NA
Inorganic Compounds (Total)			
Lead	<11	<12	<10

TABLE 3-32

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IV ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-15	CA11-16	CA11-16
SAMPLE IDENTIFICATION	030-CAP-144	030-CAP-145	030-CAP-368
SAMPLE DATE	28-APR-00	02-MAY-00	02-MAY-00
DEPTH (feet below ground surface)	7.0 to 8.0	2.0 to 3.0	3.0 to 4.0
MEDIA (Units)	Soil (mg/kg)	Soil (mg/kg)	Soil (mg/kg)
Volatile Organic Compounds			
Benzene	<0.01	<0.01	<0.01
Toluene	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01
Xylene (Total)	<0.01	<0.01	<0.01
Methyl Tertiary Butyl Ether	<0.01	<0.01	<0.01
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<10	<10	<10
Motor-oil-range Organics	<250	<250	<250
JP5-Range Organics	<10	<10	<10
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	<0.5	<0.5
Inorganic Compounds (Dissolved)			
Lead	NA	NA	NA
Inorganic Compounds (Total)			
Lead	33	<10	<12

TABLE 3-32

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IV ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-16	CA11-17	CA11-17
SAMPLE IDENTIFICATION	030-CAP-146	030-CAP-149	030-CAP-150
SAMPLE DATE	02-MAY-00	02-MAY-00	02-MAY-00
DEPTH (feet below ground surface)	6.0 to 7.0	3.0 to 4.0	6.0 to 7.0
MEDIA (Units)	Soil (mg/kg)	Soil (mg/kg)	Soil (mg/kg)
Volatile Organic Compounds			
Benzene	<0.01	<0.01	<0.01
Toluene	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01
Xylene (Total)	<0.01	<0.01	<0.01
Methyl Tertiary Butyl Ether	<0.01	<0.01	<0.01
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<10	<10	<10
Motor-oil-range Organics	<250	<250	<250
JP5-Range Organics	<10	<10	<10
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.5	<0.5	<0.5
Inorganic Compounds (Dissolved)			
Lead	NA	NA	NA
Inorganic Compounds (Total)			
Lead	<12	**19**	<12

TABLE 3-32

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IV ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 4 of 5)

POINT NAME	CA11-14	CA11-15	CA11-16
SAMPLE IDENTIFICATION	030-CAP-151	030-CAP-152	030-CAP-369
SAMPLE DATE	28-APR-00	28-APR-00	02-MAY-00
DEPTH (feet below ground surface)	3.0 to 8.0	3.0 to 8.0	3.0 to 8.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
Xylene (Total)	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	**0.34**	<0.1	**3.6**
Motor-oil-range Organics	**16**	<0.5	<2.5
JP5-Range Organics	<0.1	<0.1	**37**
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	<0.05	<0.05	**2.3**
Inorganic Compounds (Dissolved)			
Lead	<0.003	<0.003	<0.003
Inorganic Compounds (Total)			
Lead	NA	NA	NA

TABLE 3-32

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IV ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-16	CA11-17
SAMPLE IDENTIFICATION	030-CAP-153	030-CAP-155
SAMPLE DATE	02-MAY-00	02-MAY-00
DEPTH (feet below ground surface)	3.0 to 8.0	3.0 to 8.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds		
Benzene	<0.0005	<0.0005
Toluene	<0.001	<0.001
Ethylbenzene	<0.001	<0.001
Xylene (Total)	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons		
Diesel-range Organics	**5**	<0.1
Motor-oil-range Organics	<2.5	<0.5
JP5-Range Organics	**55**	<0.1
Total Purgeable Petroleum Hydrocarbons		
Gasoline-range Organics	**0.36**	<0.05
Inorganic Compounds (Dissolved)		
Lead	<0.003	<0.003
Inorganic Compounds (Total)		
Lead	NA	NA

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

TABLE 3-33

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IX ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-20	CA11-21	CA11-22
SAMPLE IDENTIFICATION	030-CAP-166	030-CAP-167	030-CAP-168
SAMPLE DATE	28-APR-00	28-APR-00	28-APR-00
DEPTH (feet below ground surface)	3.0 to 8.0	3.0 to 8.0	3.0 to 8.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001
Xylene (Total)	<0.001	<0.001	<0.001
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	**0.29**	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5	<0.5
JP5-Range Organics	**0.1**	<0.1	<0.1
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	**9**	**4.6**	**36**
Inorganic Compounds (Dissolved)			
Lead	**0.034**	**0.018**	**0.0098**

TABLE 3-33

CORRECTIVE ACTION AREA 11
DATA GAP TYPE IX ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA11-23	CA11-24	CA11-25
SAMPLE IDENTIFICATION	030-CAP-169	030-CAP-170	030-CAP-171
SAMPLE DATE	28-APR-00	28-APR-00	28-APR-00
DEPTH (feet below ground surface)	3.0 to 8.0	3.0 to 8.0	3.0 to 8.0
MEDIA (Units)	Water (mg/L)	Water (mg/L)	Water (mg/L)
Volatile Organic Compounds			
Benzene	<0.0005	<0.0005	<0.0005
Toluene	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	NA	<0.001
Xylene (Total)	<0.001	<0.001	**0.0023**
Methyl Tertiary Butyl Ether	<0.002	<0.002	<0.002
Total Extractable Petroleum Hydrocarbons			
Diesel-range Organics	<0.1	<0.1	<0.1
Motor-oil-range Organics	<0.5	<0.5	<0.5
JP5-Range Organics	<0.1	<0.1	<0.1
Total Purgeable Petroleum Hydrocarbons			
Gasoline-range Organics	**5**	**32**	<0.05
Inorganic Compounds (Dissolved)			
Lead	<0.003	**0.012**	<0.003

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.11 CORRECTIVE ACTION AREA 12

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 12.

3.11.1 Site Location and Operations Conducted

CAA 12 is located in the Corrosion Control and Aircraft Testing Zone (Zone 7) and includes Buildings 29 and 38; Facilities 461A, 461B, and 461C; and three open-space areas. Building 29 was an aircraft weapons overhaul and testing facility; Building 38 served as an acoustical enclosure for aircraft engines; and Facilities 461A, B, and C served as aircraft run-up areas. Open Space I was used for aircraft parking and repair and contained a hazardous waste storage area and a small equipment storage area. Solvents, hydraulic fluid, lube oil, jet fuel waste, and isopropyl alcohol were stored at GAP 74. Open Space II consisted of a taxiway and an aircraft parking apron, which was used for aircraft storage and repair. Open Space III consisted of roadways and taxiways and was also used for aircraft parking. No chemicals were used or stored in the area. No USTs are associated with operations conducted at CAA 12. Storm drains are located west of Seaplane Lagoon.

3.11.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 12 is designated as part of the Wildlife Refuge and Marina District land reuse areas. Land reuse may include an open space that will be designated as a wildlife refuge under the U.S. Fish and Wildlife Service, commercial and residential uses, civic/ institutional areas, and mixed-use (which may include residential uses). Groundwater at CAA 12 is designated as part of the Central Region and is not considered a potential drinking water source.

3.11.3 Previous Investigations

In 1995, IT conducted an EBS Phase IIa and IIb investigation in CAA 12 (IT 1998). Elevated concentrations of TPH were detected in soil samples collected near the northern portion of the storm drain located west of Seaplane Lagoon. Groundwater samples were not collected near the storm drain where elevated TPH concentrations were detected in soil samples.

3.11.4 Data Gap Investigation Summary

Current TTPH and TPH-associated compound concentrations in groundwater near the northern portion of the storm drain located west of Seaplane Lagoon were assessed under Data Gap Type III. The TTPH concentration was less than 1.4 mg/L and TPH-associated compound concentrations were less than AWQCs. The data gap sampling location is shown in Figure 3-11. Table 3-34 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 12 are summarized in Table 3-35 and included in Appendix D.

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

FIGURE 3-11 – CORRECTIVE ACTION AREA 12
DATA GAP SAMPLING LOCATIONS

FOR ADDITIONAL INFORMATION, CONTACT:

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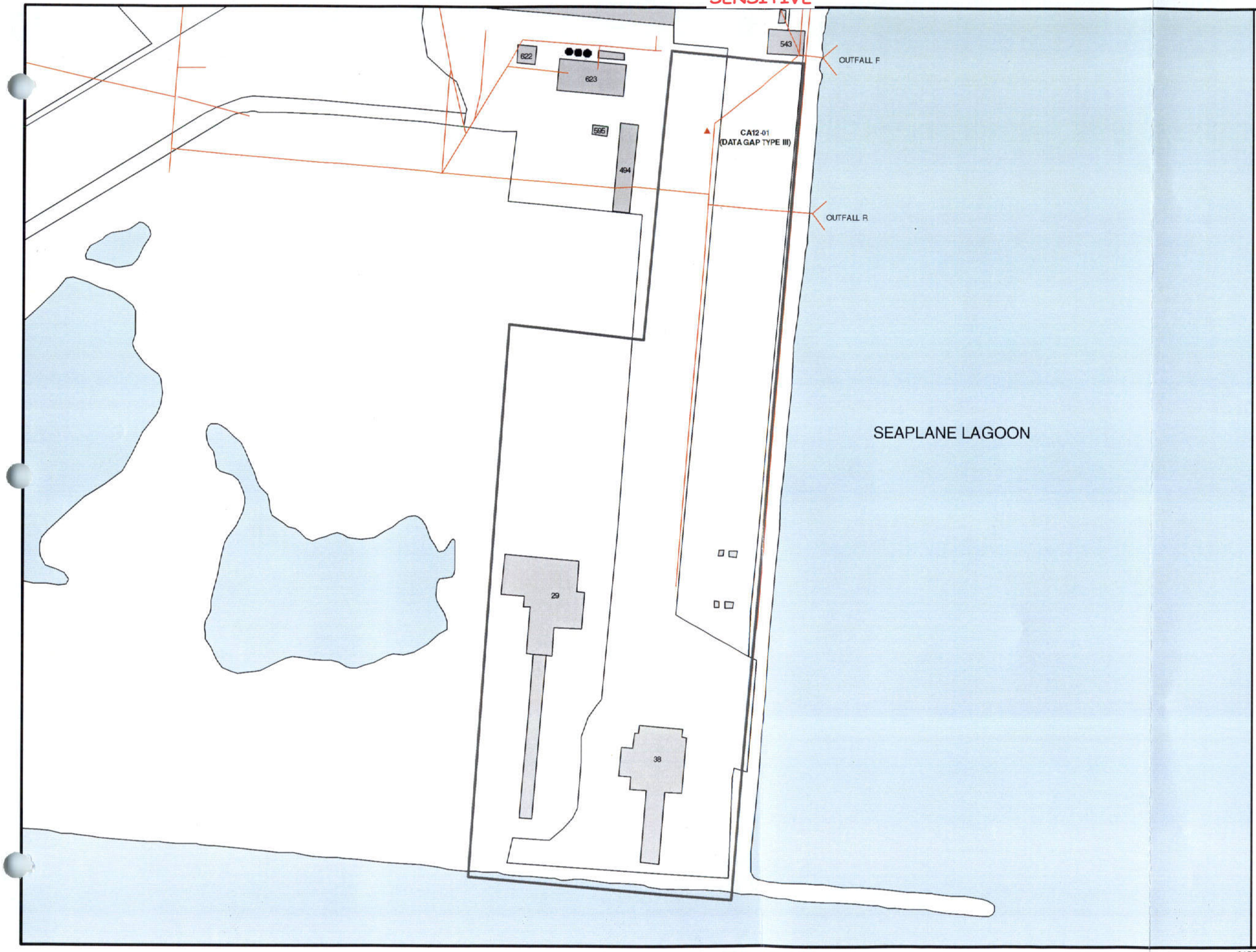
SENSITIVE



LEGEND

BOUNDARIES
- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES
- DIRECT-PUSH - GROUNDWATER

SITE FEATURES
- BUILDING
- ABOVEGROUND STORAGE TANK
- STORM DRAIN LINE

N

75 0 75 150

SCALE: 1"= 150'

FIGURE 3-11
CORRECTIVE ACTION AREA 12
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-11 LAYOUT

SENSITIVE

TABLE 3-34

CORRECTIVE ACTION AREA 12
DATA GAP INVESTIGATION SUMMARY TABLE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
(Page 1 of 1)

DATA GAP	FIELD ACTIVITIES	FIELD OBSERVATIONS
Data Gap Type III: Current Total Total Petroleum Hydrocarbons Concentrations Near Storm Drains	• One soil boring was advanced to 8 feet below ground surface, near the northern portion of the storm drain located west of Seaplane Lagoon. • One groundwater sample was collected.	• The soil boring did not have any visible staining or odors. • The groundwater sample did not have an odor or sheen.

TABLE 3-35

CORRECTIVE ACTION AREA 12
DATA GAP TYPE III ANALYTICAL RESULTS
ALAMEDA POINT, ALAMEDA, CALIFORNIA

POINT NAME	CA12-01
SAMPLE IDENTIFICATION	030-CAP-186
SAMPLE DATE	08-MAY-00
DEPTH (feet below ground surface)	3.0 to 8.0
MEDIA (Units)	Water (mg/L)
Volatile Organic Compounds	
Benzene	<0.0005
Toluene	<0.001
Ethylbenzene	<0.001
Xylene (Total)	<0.001
Methyl Tertiary Butyl Ether	<0.002
Total Extractable Petroleum Hydrocarbons	
Diesel-range Organics	<0.1
Motor-oil-range Organics	<0.5
JP5-Range Organics	<0.1
Total Purgeable Petroleum Hydrocarbons	
Gasoline-range Organics	<0.05
Inorganic Compounds (Dissolved)	
Lead	<0.003

Notes:

mg/kg Milligrams per kilograms
mg/L Milligrams per liter
NA Not analyzed

Detected concentrations are bolded.

3.12 CORRECTIVE ACTION AREA 13

The following subsections provide a brief summary of (1) the site location and operations conducted, (2) the proposed land reuse and groundwater beneficial use, (3) previous investigations, and (4) the data gap investigation conducted at CAA 13.

3.12.1 Site Location and Operations Conducted

CAA 13 is located in the Southeastern Refinery and Heavy Industrial Zone (Zone 22) within IR Sites 13 and 23. CAA 13 includes Buildings 397, 460A, 529, 530, 600, and 606; the former Pacific Coast Oil Works refinery; and paved, open spaces. Building 397 was used to test jet engines. Two OWSs are located near the eastern end of Building 397. Building 460A was a small shed used to house control equipment for a defueling facility in the area. Building 529 was used to provide auxiliary power for Building 530. Drums containing petroleum products and miscellaneous chemicals were stored within the building. Building 530 was used for missile rework operations. Waste streams generated by on-site processes were controlled, and all wastes and paint-stripping bath liquids were disposed of in 55-gallon drums at an off-site facility (TtEMI 1999b). An OWS is located west of Building 530. Building 600 was a support building for Building 530. Cooling towers and associated cooling equipment was housed in Building 600. Drums of lubricating oil and freon canisters were also stored in the building. Building 606 appeared to be an administration building during the EBS investigation. The Pacific Coast Oil Works refinery was located in the eastern portion of IR Site 13 and operated from 1879 to 1903. Operations conducted in the paved, open space of IR Site 13 included vehicle parking, material and equipment storage, recreational activities, and recreational vehicle and boat parking. Five former ASTs used for fuel storage were also located in the paved, open space. USTs have not been reported to be associated with operations conducted at CAA 13. Storm drains are located throughout CAA 13.

3.12.2 Proposed Land Reuse and Groundwater Beneficial Use

CAA 13 is designated as part of the Inner Harbor land reuse area. Land reuse may include offices, research and development areas, mixed-use (which may include residential uses), and park areas. Groundwater at CAA 13 is designated as part of the Southeastern Region and is considered a potential drinking water source.

3.12.3 Previous Investigations

In 1991, a release of JP5 occurred on the eastern side of Building 397 (PRC EMI 1992). An estimated 17,000 gallons of JP5 were released into the environment. Only 4,000 of the 17,000 gallons of JP5 were recovered by the OWSs. In March 1991, an additional 1,310 tons of contaminated soil was excavated to 2 feet below the water table in the impacted area east of Building 397 (PRC EMI 1992). Floating product was observed on the groundwater within the excavation area. TTPH levels in groundwater samples collected during the removal action also indicate that floating product may be present (TTPH >20 mg/L).

An RI for IR Site 13 was conducted between 1990 and 1994 (TtEMI 1999b). TTPH levels in a groundwater sample collected east of the former ASTs indicate that floating product may be present (TTPH >20 mg/L). Groundwater samples collected from monitoring wells indicate that a TPH plume intersects the storm drains located east of the former ASTs and north of Building 530. Elevated TTPH levels in soil samples collected within the boundaries of the former Pacific Coast Oil Works refinery (current storage unit area) indicate that a soil source area is present. Groundwater samples were not collected at the sampling locations where elevated TTPH levels were detected in soil.

During previous investigations conducted at CAA 13, samples were not collected near the OWSs located south of Building 397 and west of Building 530.

3.12.4 Data Gap Investigation Summary

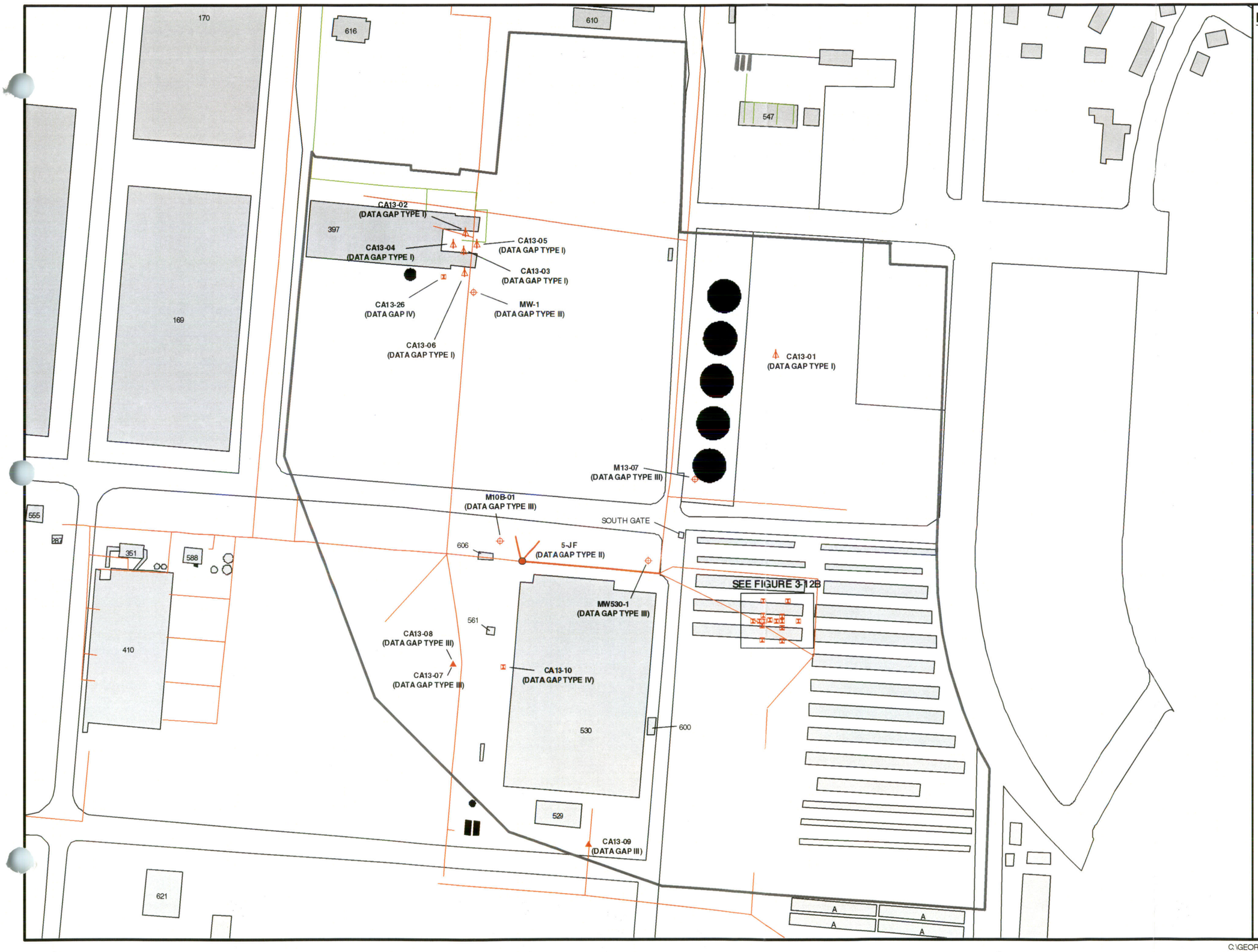
The presence of floating product near the eastern portion of Building 397 and west of the former ASTs was assessed under Data Gap Type I. Approximately six inches of floating product was present at sampling locations CA13-03 and CA13-06 (near Building 397); therefore, groundwater samples were not collected at these locations. No floating product was present and TTPH concentrations were less than 20 mg/L at all other Data Gap Type I sampling locations.

Current TTPH and TPH-associated compound concentrations in groundwater near the storm drains located east of the former ASTs and north of Building 530 were assessed under Data Gap Type III. TTPH concentrations were greater than 1.4 mg/L at sampling locations CA13-07, CA13-08, and MW530-1. Ethylbenzene also exceeded the AWQC at sampling location CA13-08.

Based on analytical results from the Data Gap Type III samples, a Data Gap Type II investigation was conducted on the storm drain reach located north of Building 530. Water in the storm drain reach located north of Building 530 had a slight hydrocarbon odor, but no sheen. Groundwater infiltrated the storm dtrain reach and two water samples were collected from MH 5JF. The TTPH concentrations were less than 1.4 mg/L and the TPH-associated compound concentrations were less than AWQCs. The storm drain reach located east of Building 397 was also investigated since floating product was found under Data Gap Type I. Floating product was present in MH 5J-2 (east of Building 397); however, the storm drain reach is reportedly capped with no release to an outfall.

The OWSs located south of Building 397 and west of Building 530 were investigated under Data Gap Type IV. The TTPH concentration exceeded the interim PRC for soil at sampling location CA13-26 (south of Building 397); however, the TTPH concentration did not exceed the revised PRC (see Section 1.1.2). TPH gasoline-range exceeded the revised residential PRC at sampling location CA13-26. The TTPH and TPH-associated compound concentrations in soil did not exceed interim residential PRCs at sampling location CA13-10 (west of Building 530). The TTPH and TPH-associated compound concentrations in groundwater at sampling locations CA13-10 and CA13-26 did not exceed 20 mg/L or MCLs, respectively.

The soil source area located in the area of the former Pacific Coast Oil Works refinery (current storage unit area) was investigated under Data Gap Type V. TTPH was detected at a maximum concentration of 66,000 mg/kg in soil and exceeded the interim PRC at 11 of 15 Data Gap Type V sampling locations. TTPH concentrations also exceed the revised PRC for soil at sampling locations CA13-17 and CA13-20 through CA13-22. TPH motor oil-range, diesel-range, and gasoline-range organics were detected at a maximum concentration of 30,000 mg/kg, 36,000 mg/kg, and 1,400 mg/kg in soil and exceeded the revised residential PRCs at 10, 9, and 1 of 15 Data Gap Type V sampling locations, respectively. TPH-associated compound concentrations in soil did not exceed interim PRCs. TTPH was detected at a maximum concentration of 1,091 mg/L in groundwater and exceeded 20 mg/L at 8 of 15 Data Gap Type V sampling locations. Benzene and lead were detected at a maximum concentration of 1.4 mg/L and 0.086 mg/L in groundwater and exceeded the MCL at 11 and 3 of 15 Data Gap Type V sampling locations, respectively. All other TPH-associated compound concentrations did not exceed MCLs. Data gap sampling locations are shown in Figures 3-12A and 3-12B. Table 3-36 summarizes field activities conducted and observations made during the data gap investigation. Analytical results for CAA 13 are summarized in Tables 3-37 through 3-41 and included in Appendix D.



LEGEND

BOUNDARIES

- CORRECTIVE ACTION AREA BOUNDARY
- LAND COVER

DATA GAP SAMPLES

- DIRECT-PUSH - GROUNDWATER
- DIRECT-PUSH - SOIL/GROUNDWATER
- FLOATING PRODUCT PIEZOMETER
- MONITORING WELL
- MANHOLE

SITE FEATURES

- BUILDING
- ABOVEGROUND STORAGE TANK
- UNDERGROUND STORAGE TANK
- FUEL LINE
- STORM DRAIN LINE
- INVESTIGATED STORM DRAIN LINE

N

75 0 75 150

SCALE: 1"= 150'

FIGURE 3-12 A
CORRECTIVE ACTION AREA 13
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DGI\CAA_JAN1 FIG3-12A LAYOUT

Continue

CA13-22
(DATA GAP TYPE V)

CA13-24
(DATA GAP TYPE V)

CA13-15
(DATA GAP TYPE V)

CA13-17
(DATA GAP TYPE V)

CA13-12
(DATA GAP TYPE V)

CA13-21
(DATA GAP TYPE V)

CA13-11
(DATA GAP TYPE V)

CA13-23
(DATA GAP TYPE V)

CA13-25
(DATA GAP TYPE V)

CA13-13
(DATA GAP TYPE V)

CA13-14
(DATA GAP TYPE V)

CA13-16
(DATA GAP TYPE V)

CA13-20
(DATA GAP TYPE V)

CA13-19
(DATA GAP TYPE V)

CA13-18
(DATA GAP TYPE V)

LEGEND

DATA GAP SAMPLE

DIRECT-PUSH - SOIL/GROUNDWATER

SITE FEATURE

STORM DRAIN LINE

BUILDING

N

10 0 10 20

SCALE: 1"= 20'

FIGURE 3-12 B
CORRECTIVE ACTION AREA 13
STORAGE UNIT AREA
DATA GAP SAMPLING LOCATIONS
ALAMEDA POINT
ALAMEDA, CALIFORNIA
MARCH 2, 2001

TC.0030.10824

C:\GEORGIES\PROJECT\DGS\CTO30_DG\CAA_JAN1 FIG3-12B LAYOUT